DOE Office of Science

FY 2008

Performance Evaluation of UChicago Argonne, LLC for the Management and Operation of Argonne National Laboratory

February 2009

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I. OVERALL SUMMARY RATING/FEE

Performance-Based Score and Adjectival Rating

The evaluation of UChicago Argonne, LLC (the Contractor) management and operation of the Argonne National Laboratory (the Laboratory) during FY 2008 centered on the results of meeting Objectives found within the following Performance Goals:

1.0 Provide for Efficient and Effective Mission Accomplishment (Quality, Productivity, Leadership, & Timeliness of Research and Development)

2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Facilities

3.0 Provide Effective and Efficient Science and Technology Research Project/Program Management

4.0 Provide Sound and Competent Leadership and Stewardship of the Laboratory

5.0 Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection

6.0 Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission(s)

7.0 Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs

8.0 Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems

Each Performance Goal was composed of two or more weighted Objectives, and most Objectives had a set of performance measures which served as the basis in determining the Contractor's overall performance in meeting that Objective. Each of the performance measures identified significant activities, requirements, and/or milestones important to the success of the corresponding Objective. The following describes the methodology utilized in determining the Contractor performance rating.

Each Objective within a Goal was assigned a numerical score by the evaluating office. Each evaluation measured the degree of effectiveness and performance of the Contractor in meeting the Objective and was based on the Contractor's success in meeting the set of Performance Measures/Targets identified for each Objective, as well as other performance information available to the evaluating office from other sources to include, but not limited to, the Contractor's self-evaluation report, operational awareness (daily oversight) activities; "For Cause" reviews (if any); other outside agency reviews (OIG, GAO, DCAA, etc.), and the annual 2-week review (if needed). If no performance measures/targets were utilized the description of the general expectations for the success of the objective was utilized as the baseline of the effectiveness and performance of the Contractor in meeting the corresponding Objective and in determining the score assigned. The Goal score was then computed by multiplying the numerical score by the weight of each Objective within a Goal. These values were then added together to develop an overall score for each Goal. This score was then compared to Table A to determine the overall grade for each Goal. A set of tables is provided at the end of each Performance Goal section of this document to assist in the calculation of Objective scores to the Goal score. The raw score (rounded to the nearest hundredth) from each calculation was carried through to the next stage of the calculation process. The raw score for Science and Technology and Management and Operations was rounded to the nearest tenth of a point for utilization in determining fee as discussed below. A standard rounding convention of x.44 and less rounds down to the nearest tenth (here, x.4), while x.45 and greater rounds up to the nearest tenth (here, x.50).

Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0

Table A – FY 2008 Contractor Letter Grade Scale

Based on the evaluation of the UChicago Argonne, LLC's performance against the Goals and Objectives contained within the FY 2008 Performance Evaluation and Measurement Plan (PEMP), the scores and corresponding grades awarded for each are provided within Table B below. Specific information regarding the Contractor's performance in meeting each of the Goals and their corresponding Objectives is provided within Section II of this report.

S&T Performance Goal	Numerical Score	Letter Grade	Weight	Weighted Score	Total Score
1.0 Mission Accomplishment	3.6	A-	37%	1.34	
2.0 Design, Fabrication, Construction and Operations of Facilities	3.5	A-	38%	1.35	
3.0 Science and Technology Research Project/Program Management	3.5	A-	25%	0.86	
				Total Score	3.6
M&O Performance Goal	**Numerical Score**	**Letter Grade**	**Weight**	**Weighted Score**	**Total Score**
4.0 Leadership and Stewardship of the Laboratory	3.2	B+	20%	0.64	
5.0 Integrated Safety, Health, and Environmental Protection	2.8	B	30%	0.84	
6.0 Business Systems	3.5	A-	20%	0.71	
7.0 Operating, Maintaining, and Renewing Facility and Infrastructure Portfolio	3.6	A-	20%	0.72	
8.0 Integrated Safeguards and Security Management and Emergency Management Systems	3.4	B+	10%	0.34	
				Total Score	3.3

Table B – FY 2008 Contractor Evaluation Score Calculation

Performance-Based Fee Earned

Utilizing Table B, above, the scores for each of the Science and Technology (S&T) Goals and Management and Operations (M&O) Goals were multiplied by the weight assigned and these were summed to provide an overall score for each. The percentage of the available performance-based fee that was earned by the Contractor was determined based on the overall weighted score for the S&T Goals (see Table B) and then compared to Table C, below. The overall numerical score of the M&O Goals from Table B was then utilized to determine the final fee multiplier (see Table C), which was utilized to determine the overall amount of performance-based fee earned for FY 2008 as calculated within Table D. Based on the overall performance within the S&T and M&O Goals the Contractor is awarded $4,982,000 in performance based fee for FY 2008.

Overall Weighted Score from Table A	Percent S&T Fee Earned	M&O Fee Multiplier
4.3	100%	100%
4.2		
4.1		
4.0	97%	100%
3.9		
3.8		
3.7	94%	100%
3.6		
3.5		
3.4	91%	100%
3.3		
3.2		
3.1		
3.0	88%	95%
2.9		
2.8		
2.7	85%	90%
2.6		
2.5		
2.4	75%	85%
2.3		
2.2		
2.1		
2.0	50%	75%
1.9		
1.8		
1.7	0%	60%
1.6		
1.5		
1.4		
1.3		
1.2		
1.1		
1.0 to 0.8	0%	0%
0.7 to 0.0	0%	0%

Table C – Performance-Based Fee Earned Scale

Overall Fee Determination	
Percent S&T Fee Earned from Table C	94 %
M&O Fee Multiplier from Table C	X 100 %
Overall Earned Performance-Based Fee	94.0 %

Table D – Final Percentage of Performance-Based Fee Earned Determination

II. PERFORMANCE GOALS, OBJECTIVES, AND MEASURES/TARGETS

1.0 Provide for Efficient and Effective Mission Accomplishment (Quality, Productivity, Leadership, and Timeliness of Research and Development)

The Contractor produces high-quality, original, and creative results that advance science and technology; demonstrates sustained scientific progress and impact; receives appropriate external recognition of accomplishments; and contributes to overall research and development goals of the Department and its customers.

The weight of this Goal is 37%.

Goal 1 measured the overall effectiveness and performance of the Contractor in delivering science and technology results which contributed to and enhanced the DOE's mission of protecting our national and economic security by providing world-class scientific research capacity and advancing scientific knowledge by supporting world-class, peer-reviewed scientific results, which were recognized by others.

ASCR –

- Key role in ASCR research efforts with many significant contributions to science and high performance computing (HPC)
- ANL is hugely influential in programming models for leadership computing with important advancements in FY08

BER –

- The Structural Biology Center (SBC) at the Advanced Photon Source (APS) continues to provide world leadership in the field of protein structure determination.
- ANL has tremendous unrealized potential with its limited research program that is excellent and in some cases (e.g., structural biology) world class.
- Overall, the very limited amount of research in environmental remediation sciences, climate change, and life sciences other than structural biology is a concern and a challenge for the laboratory to continue development efforts.

BES –

- The materials sciences research programs have demonstrated sustained leadership and significant impact in x-ray and neutron scattering science and instrumentation, magnetic and superconducting materials.
- Chemical sciences research programs in atomic molecular and optical sciences, heavy element chemistry, separations, chemical dynamics, and photochemistry continued to demonstrate sustained scientific progress and impact.

HEP –

- Detector development and accelerator science are two strengths of the ANL High Energy Physics.
- ANL's HEP program features hadron collider physics using ATLAS and CDF, neutrino physics using MINOS and NOvA, particle physics theory, and particle astrophysics with VERITAS and DES.
- ANL performs research in accelerator science and R&D on superconducting RF.
- The Argonne Wakefield Acceleratory (AWA) group has shown that dielectric structures can sustain accelerating gradients over 100MV/m, which is almost five times the gradient typically used in accelerators today.

NP –

- ANL NP group performs at a high level in all areas in mission accomplishment.
- ANL Low Energy (LE) group is among the world leaders in the exploration of properties of weakly-bound nuclei near proton dripline, use of unstable nuclei to study reactions of interest to nuclear astrophysics, and mass measurements with high precision.

- ANL scientists are leaders in the development of superconducting radiofrequency accelerating cavities for heavy ion applications.

WDTS –

- The science education at Argonne has developed a well-established mentor culture within the laboratory.
- The accomplishments of interns needs to be better validated by improving quality research abstracts.
- The large majority of WDTS supported interns/educators report through participant surveys a rewarding, but very challenging laboratory experience.

NE –

- Research and Development conducted by ANL provides important information to support Advanced Fuel Cycle Initiative in the areas of fast reactors, particularly sodium fast reactors, and advanced waste forms.
- Senior technical expertise in separation technology, fast reactors technology, or waste forms, the principal investigators at ANL are routinely identified as leaders in their areas.

NN –

- ANL has provided outstanding support in furthering the goals of the NNSA Global Threat Reduction Initiative, (GTRI) and thereby furthering U.S. goals in nonproliferation and prevention of nuclear terrorism.
- Support from Argonne has been technically outstanding, timely, and relevant to both the technical and policy objectives of GTRI.

EERE –

- ANL's Greenhouse Gases, Regulated Emissions and Energy Use in Transportation (GREET) model has been used by many organizations for evaluating the lifecycle greenhouse gas emissions associated with a variety of fuels, including biofuels.
- Argonne has been extremely responsive to task required by DOE headquarters.

***See Attachment I for the input that was provided by the Program Offices.**

Science Program Office	Letter Grade	Numerical Score	Weight	Weighted Score	Overall Score
Office of Advanced Scientific Research					
1.1 Impact	A	3.7	40%	1.48	
1.2 Leadership	A-	3.8	30%	1.14	
1.3 Output	B+	3.4	15%	0.51	
1.4 Delivery	B+	3.2	15%	0.48	
				Overall ASCR Total	3.61
Office of Basic Energy Sciences					
1.1 Impact	B+	3.2	50%	1.60	
1.2 Leadership	B+	3.3	20%	0.66	
1.3 Output	A	3.8	15%	0.57	
1.4 Delivery	A	3.8	15%	0.57	
				Overall BES Total	3.40
Office of Biological and Environmental Research					
1.1 Impact	B+	3.1	30%	0.93	
1.2 Leadership	B+	3.1	20%	0.62	
1.3 Output	B	2.8	20%	0.56	
1.4 Delivery	B+	3.1	30%	0.93	
				Overall BER Total	3.04

Office of High Energy Physics					
1.1 Impact	A-	3.5	30%	1.05	
1.2 Leadership	A-	3.5	30%	1.05	
1.3 Output	B+	3.4	30%	1.02	
1.4 Delivery	B+	3.4	10%	0.34	
				Overall HEP Total	3.46
Office of Nuclear Physics					
1.1 Impact	A	4.0	35%	1.40	
1.2 Leadership	A	3.9	25%	0.98	
1.3 Output	A	3.8	25%	0.95	
1.4 Delivery	A	3.8	15%	0.57	
				Overall NP Total	3.90
Office of Workforce Development for Teachers and Scientists					
1.1 Impact	B+	3.2	25%	0.80	
1.2 Leadership	B+	3.3	30%	0.99	
1.3 Output	B+	3.2	30%	0.96	
1.4 Delivery	B-	2.5	15%	0.38	
				Overall WDTS Total	3.13

Table 1.1 – Goal 1 SC Program Office Performance Score Development

Science Program Office	Letter Grade	Numerical Score	Funding Weight (BA)	Weighted Score	Overall Weighted Score
Office of Advanced Scientific Research	A-	3.61	17.8%	0.64	
Office of Basic Energy Sciences	B+	3.40	55.9%	1.90	
Office of Biological and Environmental Research	B	3.04	6.9%	0.21	
Office of High Energy Physics	A-	3.46	8.1%	0.28	
Office of Nuclear Physics	A	3.90	10.6%	0.41	
Office of Workforce Development for Teachers and Scientists	B+	3.13	0.8%	0.02	
				Performance Goal 1.0 Total	3.47

Table 1.2 – SC Program Office Overall Performance Score Development

Other HQ Program Offices	Letter Grade	Numerical Score	Weight	Weighted Score	Overall Score
Assistant Secretary for Energy Efficiency and Renewable Energy					
1.1 Impact	A	3.9	35%	1.38	
1.2 Leadership	A	3.9	20%	0.79	
1.3 Output	A	3.9	25%	0.98	
1.4 Delivery	A	3.9	20%	0.78	
				Overall EERE Total	3.92
Office of Nuclear Energy, Science and Technology					
1.1 Impact	A	4.0	30%	1.20	
1.2 Leadership	A	3.9	30%	1.17	
1.3 Output	A	3.8	20%	0.76	
1.4 Delivery	A	4.0	20%	0.80	
				Overall NE Total	3.93

National Nuclear Security Administration					
1.1 Impact	A	4.0	40%	1.60	
1.2 Leadership	A	4.0	20%	0.80	
1.3 Output	A	4.0	20%	0.80	
1.4 Delivery	A	4.0	20%	0.80	
				Overall NNSA Total	4.00

Table 1.3 – Goal 1 Other Program Offices and Customer Performance Score Development

HQ Program Office	Letter Grade	Numerical Score	Funding Weight (BA)	Weighted Score	Overall Weighted Score
Office of Science	A-	3.47	66.9%	2.32	
Office of Energy Efficiency and Renewable Energy	A	3.92	12.5%	0.49	
Office of Nuclear Energy, Science and Technology	A	3.93	9.5%	0.37	
National Nuclear Security Administration	A	4.00	11.1%	0.44	
				Performance Goal 1.0 Total	3.62

Table 1.4 – Goal 1 Overall Performance Score Development

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Table 1.5 – Goal 1 Final Letter Grade

2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Facilities

The Contractor provides effective and efficient strategic planning; fabrication, construction and/or operations of Laboratory facilities; and is responsive to the user community.

The weight of this Goal is 38%.

Goal 2 measures the overall effectiveness and performance of the Contractor in planning for and delivering leading-edge specialty research and/or user facilities to ensure the required capabilities are present to meet today's and tomorrow's complex challenges. It also measured the Contractor's innovative operational and programmatic means for implementation of systems that ensures the availability, reliability, and efficiency of these facilities; and the appropriate balance between R&D and user support.

ASCR –

- Argonne Leadership Computing Facility (ALCF) successfully completed the project within cost, schedule, and ahead of schedule.
- ALCF supported 20 Innovative and Novel Computational Impact on Theory and Computation (INCITE) projects.
- ALCF success was due in large part to the high quality of the project staff and the oversight of the Federal Project Director.

BER –

- The SBC at the APS leads the world in its efficient use of its beamline.
- The Atmospheric Radiation Measurement (ARM) Climate Research Facility (ACRF) exceeded its operational metrics and its Environmental Safety and Health record was exceptional.
- ANL's SBC and ACRF are leading facilities for the conduct of biological and climate change research
- ANL needs to use either the SBC or the ACRF to grow its internal climate or biology research programs.

BES –

- APS continues to be a leading national facility with a large number of users and publications, its management has not demonstrated visionary leadership in strategic planning and in effective management of its Short Pulse X-ray Source Project.
- Center for Nanoscale Materials (CNM) has operated a robust user program with outstanding scientific output.
- APS operated with very high reliability of 97.6 % with increased user support on the CAT beamlines that have transitioned to facility beamlines.

NP –

- Delivery of 5670 hours of stable and radioactive ion beams for 47 experiments.
- Sustained progress toward energy upgrade of ATLAS, and construction of CARIBU, and is on track for timely completion.
- ATLAS staff effectively exploits the synergy between the radioactive ion beam R&D with the improvement of ATLAS and its experimental systems.

EERE –

- Argonne operates a one-or-a kind fuel cell test facility, unique among National Laboratories, with capabilities for evaluating full-size automotive fuel cell systems of up to 100 kW in size.
- ANL operates and maintains one of the most advanced four-wheel chassis dynamometers in the country and utilizes this facility on a daily basis for the conduct of vehicle and component evaluations for the Vehicle Technologies Program.

- ANL's analysis capabilities are significant and they are working toward developing a user facility to accommodate the Biomass Program's hybrid technologies, in particular syngas fermentation.

***Please see Attachment I for the input that was provided by the Program Offices.**

Science Program Office	Letter Grade	Numerical Score	Weight	Weighted Score	Overall Score
Office of Advanced Scientific Research					
2.1 Provide Effective Facility Design(s)	N/A	N/A	N/A	N/A	
2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components	B+	3.4	15%	0.51	
2.3 Provide Efficient and Effective Operation of Facilities	A	4.0	75%	3.00	
2.4 Utilization of Facility to Grow and Support Lab's Research Base and External User Community	A-	3.7	10%	0.37	
				Overall ASCR Total	3.88
Office of Basic Energy Sciences					
2.1 Provide Effective Facility Design(s)	B+	3.2	10%	0.32	
2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components	A-	3.7	25%	0.93	
2.3 Provide Efficient and Effective Operation of Facilities	B	3.0	45%	1.35	
2.4 Utilization of Facility to Grow and Support Lab's Research Base and External User Community	A-	3.6	20%	0.72	
				Overall BES Total	3.32
Office of Biological and Environmental Research					
2.1 Provide Effective Facility Design(s)	N/A	N/A	N/A	N/A	
2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components	N/A	N/A	N/A	N/A	
2.3 Provide Efficient and Effective Operation of Facilities	A	3.8	90%	3.42	
2.4 Utilization of Facility to Grow and Support Lab's Research Base and External User Community	B	2.9	10%	0.29	
				Overall BER Total	3.71
Office of High Energy Physics					
2.1 Provide Effective Facility Design(s)	B+	3.4	50%	1.70	
2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components	B+	3.4	50%	1.70	
2.3 Provide Efficient and Effective Operation of Facilities	N/A	N/A	N/A	N/A	
2.4 Utilization of Facility to Grow and Support Lab's Research Base and External User Community	N/A	N/A	N/A	N/A	
				Overall HEP Total	3.40

Office of Nuclear Physics					
2.1 Provide Effective Facility Design(s)	N/A	N/A	0%	N/A	
2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components	N/A	N/A	0%	N/A	
2.3 Provide Efficient and Effective Operation of Facilities	A-	3.7	85%	3.15	
2.4 Utilization of Facility to Grow and Support Lab's Research Base and External User Community	A-	3.7	15%	0.56	
				Overall NP Total	3.70

Table 2.1 – Goal 2 Program Office Performance Score Development

Science Program Office	Letter Grade	Numerical Score	Funding Weight (BA)	Weighted Score	Overall Weighted Score
Office of Advanced Scientific Research	A	3.88	13.1%	0.51	
Office of Basic Energy Sciences	B+	3.32	68.2%	2.26	
Office of Biological and Environmental Research	A-	3.71	10.0%	0.37	
Office of High Energy Physics	B+	3.40	1.0%	0.03	
Office of Nuclear Physics	A-	3.70	7.8%	0.29	
				Performance Goal 2.0 Total	3.46

Table 2.2 - SC Program Office Overall Performance Score Development

Other HQ Program Offices	Letter Grade	Numerical Score	Weight	Weighted Score	Overall Score
Assistant Secretary for Energy Efficiency and Renewable Energy					
2.1 Provide Effective Facility Design(s)	N/A	N/A	0%	N/A	
2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components	N/A	N/A	0%	N/A	
2.3 Provide Efficient and Effective Operation of Facilities	A	3.90	70%	2.73	
2.4 Utilization of Facility to Grow and Support Lab's Research Base and External User Community	A	3.90	30%	1.17	
				Overall EERE Total	3.90

Table 2.3 – Goal 2 Other Program Offices and Customer Performance Score Development

HQ Program Office	Letter Grade	Numerical Score	Funding Weight (BA)	Weighted Score	Overall Weighted Score
Office of Science	A-	3.46	88.0%	3.04	
Assistant Secretary for Energy Efficiency and Renewable Energy	A	3.90	12.0%	0.47	
				Overall Program Office Total	3.51

Table 2.4 – Goal 2 Overall Performance Score Development

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Table 2.4 – Goal 2 Final Letter Grade

3.0 Provide Effective and Efficient Science and Technology Research Project/Program Management

The Contractor provides effective program vision and leadership; strategic planning and development of initiatives; recruits and retains a quality scientific workforce; and provides outstanding research processes, which improve research productivity.

The weight of this Goal is 25%.

Goal 3 measured the Contractor's overall leadership in executing S&T programs. Dimensions of program management covered included: 1) providing key competencies to support research programs to include key staffing requirements; 2) providing quality research plans that take into account technical risks and identify actions to mitigate risks; and 3) maintaining effective communications with customers to include providing quality responses to customer needs.

ASCR –

- ANL is a leader in HPC, applied math, and computational science, making significant contributions to the vision, planning and coordination of these efforts and changing the thinking or direction of the international community.
- ANL has worked hard in FY08 to overcome those obstacles and ASCR is very pleased with the results of those efforts but serious mistakes were made early on that required senior DOE intervention.

BER –

- ANL exhibits outstanding management of programs related to or associated with the SBC and ACRF, including doing an excellent job of proactively communicating with BER program managers.
- ANL has been relatively ineffective in efforts to expand its environmental, climate, and non-SBC focused biology programs.

BES –

- The Materials Science Division has demonstrated effective program management and leadership in developing compelling program visions through effective strategic planning.
- Program management within the newly formed ANL Chemical and Engineering Sciences Division is still in transition, and needs a clearly defined strategic plan that is well aligned with objectives of the laboratory and of the BES program.
- The interim Chemistry Division leadership was effective and responsive to BES mission needs
- The APS had serious shortcomings in the scientific and technical leadership in both the Accelerator Systems Division and the X-ray Science Divisions.

HEP –

- The ANL HEP Division dealt effectively to mitigate the impact of the reduced funding due to the FY08 Omnibus Appropriation.
- The Director of the HEP Division has reached out to other parts of ANL to find expertise to support the high energy physics mission.

NP –

- Effective management of the ATLAS facility for research by an international user community.

- Continued a well-coordinated effort to enhance research capabilities at ATLAS, including both accelerator and instrumental systems.
- ANL is one of the key centers for RIB R&D, and one of the two laboratories that submitted a proposal to site the next generation FRIB.
- Responsive actions and communications concerning facility and future operations and future plans.

WDTS –

- WDTS sponsored laboratory research participants evaluation data report a high quality research experience.
- The mentor /protégé relationship was good.
- The research experience met expectations; the overall laboratory experience has strengthened commitments to pursue science/math/engineering careers but more time actually working on their research project.

NE –

- During a significant portion of FY08, ANL provided "campaign" leadership for both separations and waste form R&D projects at ten National Laboratories.

NN –

- Argonne has provided effective and efficient program management as demonstrated by its ability to support an increasing rate of domestic and international reactor conversions and by its timely and appropriate response to GTRI program requirements and headquarters tasking.

EERE –

- Effective program vision and leadership.
- Effective and efficient science and technology project and program planning and management.
- Effective and efficient communications and responsiveness to EERE and Project Management Center (PMC) needs.

***Please see Attachment I for the input that was provided by the Program Offices.**

Science Program Office	Letter Grade	Numerical Score	Weight	Weighted Score	Overall Score
Office of Advanced Scientific Research					
3.1 Effective and Efficient Stewardship	A-	3.5	30%	1.05	
3.2 Project/Program Planning and Management	B+	3.1	40%	1.24	
3.3 Communications and Responsiveness	B-	2.5	30%	0.75	
				Overall ASCR Total	3.04
Office of Basic Energy Sciences					
3.1 Effective and Efficient Stewardship	B	3.0	40%	1.20	
3.2 Project/Program Planning and Management	B+	3.3	30%	0.99	
3.3 Communications and Responsiveness	A	3.8	30%	1.14	
				Overall BES Total	3.33
Office of Biological and Environmental Research					
3.1 Effective and Efficient Stewardship	B-	2.7	20%	0.54	
3.2 Project/Program Planning and Management	B-	2.5	30%	0.75	
3.3 Communications and Responsiveness	A	3.5	50%	1.75	
				Overall BER Total	3.04

Office of High Energy Physics					
3.1 Effective and Efficient Stewardship	A-	3.5	40%	1.40	
3.2 Project/Program Planning and Management	A-	3.6	40%	1.44	
3.3 Communications and Responsiveness	A-	3.5	20%	0.70	
				Overall HEP Total	3.54
Office of Nuclear Physics					
3.1 Effective and Efficient Stewardship	A	3.9	40%	1.56	
3.2 Project/Program Planning and Management	A	4.0	40%	1.60	
3.3 Communications and Responsiveness	A-	3.7	20%	0.74	
				Overall NP Total	3.90
Office of Workforce Development for Teachers and Scientists					
3.1 Effective and Efficient Stewardship	B+	3.3	20%	0.66	
3.2 Project/Program Planning and Management	B+	3.2	40%	1.28	
3.3 Communications and Responsiveness	B+	3.4	40%	1.36	
				Overall WDTS Total	3.30

[1] A complete listing of the S&T Goals & Objectives weightings for the SC Programs is provided within Attachment I to this plan.

Table 3.1 – Goal 3 SC Program Office Performance Score Development

Science Program Office	Letter Grade	Numerical Score	Funding Weight (BA)	Weighted Score	Overall Weighted Score
Office of Advanced Scientific Research	B	3.04	14.2%	0.43	
Office of Basic Energy Sciences	B+	3.33	59.3%	1.98	
Office of Biological and Environmental Research	B	3.04	10.9%	0.33	
Office of High Energy Physics	A-	3.54	6.5%	0.23	
Office of Nuclear Physics	A	3.90	8.4%	0.33	
Office of Workforce Development for Teachers and Scientists	B+	3.30	0.7%	0.02	
				Performance Goal 3.0 Total	3.32

Table 3.2 – SC Program Office Overall Performance Score Development

Other HQ Program Offices	Letter Grade	Numerical Score	Weight	Weighted Score	Overall Score
Assistant Secretary for Energy Efficiency and Renewable Energy					
3.1 Effective and Efficient Stewardship	A	3.9	20%	0.77	
3.2 Project/Program Planning and Management	A	3.9	40%	1.56	
3.3 Communications and Responsiveness	A	3.9	40%	1.56	
				Overall EERE Total	3.89
Office of Nuclear Energy					
3.1 Effective and Efficient Stewardship	N/A	N/A	N/A	N/A	
3.2 Project/Program Planning and Management	A-	3.5	100%	3.50	
3.3 Communications and Responsiveness	N/A	N/A	N/A	N/A	
				Overall NE Total	3.50

Office of Defense Nuclear Nonproliferation					
3.1 Effective and Efficient Stewardship	A	4.0	20%	0.80	
3.2 Project/Program Planning and Management	A	4.0	30%	1.20	
3.3 Communications and Responsiveness	A	4.0	50%	2.00	
				Overall NNSA Total	4.00

Table 3.3 – Goal 3 Other Program Offices and Customer Performance Score Development

HQ Program Office	**Letter Grade**	**Numerical Score**	**Funding Weight (BA)**	**Weighted Score**	**Overall Weighted Score**
Office of Science	B+	3.32	63.2%	2.10	
Office of Energy Efficiency and Renewable Energy	A	3.89	16.1%	0.63	
Office of Nuclear Energy	A-	3.50	9.6%	0.33	
Office of Defense Nuclear Nonproliferation	A	4.00	11.1%	0.45	
				Performance Goal 3.0 Total	3.50

Table 3.4 – Goal 3 Overall Performance Score Development

Total Score	**4.3-4.1**	**4.0-3.8**	**3.7-3.5**	**3.4-3.1**	**3.0-2.8**	**2.7-2.5**	**2.4-2.1**	**2.0-1.8**	**1.7-1.1**	**1.0-0.8**	**0.7-0**
Final Grade	**A+**	**A**	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D**	**F**

Table 3.5 – Goal 3 Final Letter Grade

4.0 Provide Sound and Competent Leadership and Stewardship of the Laboratory

The Contractor's Leadership provides effective and efficient direction in strategic planning to meet the mission and vision of the overall Laboratory; is accountable and responsive to specific issues and needs when required; and corporate office leadership provides appropriate levels of resources and support for the overall success of the Laboratory.

The weight of this Goal is 20%.

Goal 4 measured the Contractor's Leadership capabilities in leading the direction of the overall Laboratory. It also measured the responsiveness of the Contractor to issues and opportunities for continuous improvement and corporate office involvement/commitment to the overall success of the Laboratory.

4.1 Provide a Distinctive Vision for the Laboratory and an Effective Plan for Accomplishment of the Vision to Include Strong Partnerships Required to Carry Out those Plans

Accomplishments

- Over the past year the Laboratory has been in the process of fully developing their Strategic Plan for the Laboratory. The April 30, 2008 Strategic Plan presentation resulted in the laboratory developing the July 1, 2008 submittal of the "Department of Energy Laboratory Plan for the Office of Science's Argonne National Laboratory". This document was considered to be an improvement. Since then the Laboratory has continued to develop their Strategic Plan. Argonne senior management has also engaged a consulting firm to help develop the Lab-level planning process and deliver the Argonne Strategic Plan in early FY09.

- A closely related strategic planning effort was the plan for Argonne's campus and facilities which was completed in FY08. The first project as result of this plan is the Energy Sciences Building (ESB). The ESB project Critical Decision 0 (CD-0) Mission Need statement was approved on October 10, 2008. Argonne is now proceeding with the conceptual design and siting for the facility.

- A number of active community outreach programs help Argonne to build and maintain excellent relations with surrounding communities. The Argonne-DOE Community Leaders Round Table (CLRT) continues to exceed expectations.

- Argonne has developed a baseline for understanding and trending the cost of doing business that has been used as a model template for use in advising other laboratories on their cost tracking models.

Concerns/Issues

- Overall, the strategic planning of the laboratory has improved, but is still in the development stage. This has prevented a clear articulation and understanding of the laboratory's long range goals. Without the strategic plan it has been and will continue to be difficult to obtain the commitment on critically needed facilities for the laboratory.

Assessment of Objective 4.1:

Based on performance measure results and the additional information provided above, ASO assigns the grade of B.

4.2 Provide for Responsive and Accountable Leadership throughout the Organization

Accomplishments

- The performance of laboratory leadership has improved through reorganization and the addition of several key personnel (Deputy for Operations, Deputy for Programs, and Director of Safety and Nuclear Operations) and support of the UChicago Argonne and Jacobs Engineering. Yet stability of the organization will likely not be realized until a new Lab Director arrives and key personnel are fully aligned with the Strategic Plan. The Laboratory's Chief Financial Officer (CFO) and General Counsel were replaced with interim leadership, and searches were launched to identify their permanent replacements. The CFO position has since been filled in FY09 and started December 1, 2008.

- Nuclear Footprint Reduction (NFR) and nuclear safety compliance were major efforts of Argonne in FY08. Argonne, working closely with DOE, completed the NFR 3-Year Compliance Plan, which will need to be funded from the laboratory's overhead. UChicago Argonne, LLC committed $5 million of the FY08 indirect over-recovery to the NFR. Progress on the NFR Plan has resulted in B-315 Vault 40 and B-205 G-Wing being re-categorized to radiological facilities.

Concerns/Issues

- An area still needing improvement is inadequate Lab-wide policies and procedures (e.g., work planning and control) that allow Divisions to inconsistently address ES&H issues, creating vulnerabilities they may not recognize or understand. Also, in the property management area there was a lack of timely attention to the vehicle management issues, resulting in DOE's inability to provide unconditional approval of the property management system.

Assessment of Objective 4.2:

Based on performance measure results and the additional information provided above, ASO assigns the grade of B.

4.3 Provide Efficient and Effective Corporate Office Support as Appropriate

Accomplishments

- The UChicago Argonne, LLC initiated several activities in FY08 to focus attention on improving the safety culture of Argonne. The former Chief Engineer and Vice President of Engineering and Operations at DuPont, was named Chair of the ESSH Committee. Throughout FY08, he has increased the frequency of ESSH Committee meetings and focused the Committee and the Laboratory on meeting DOE expectations related to nuclear safety. Early in FY08, UChicago determined that Argonne's chronic problems with nuclear safety (and other issues) reflected systemic leadership problems in Laboratory operations. To address the issues, UChicago Argonne, LLC convened a high level committee in December 2007. This committee was chaired by the former Director of Lawrence Berkley National Laboratory and also included the former Laboratory Director of Oak Ridge National Laboratory (ORNL), the current Chief Operating Officer of ORNL and the President and Director of Sandia National Laboratory. Also, UChicago commissioned a senior management review led by the Director of McKinsey & Co., in December 2007. The results of these reviews informed the re-organization of Argonne that was implemented in February 2008.

- In response to the Argonne Laboratory Director's announcement that he will step down at the conclusion of his term on June 30, 2009, the University of Chicago has initiated a Search Committee charged with conducting an international search to identify the next Laboratory Director. The Search Committee has selected Spencer Stuart, a leading privately held global executive search firm, to assist in the search. Several meetings have been held, including a Town Hall meeting at Argonne for the committee to solicit input from the Laboratory. The first round interviews were performed early in December 2008 followed by a second round visits in early 2009.

- Additional reviews that UChicago Argonne, LLC has performed resulted in efficiencies in the following:
    - A review of Blue Cross/Blue Shield of Illinois health claims was conducted by KPMG.
    - A review of Argonne's overhead budget planning process was conducted by Reese Partners.
    - The University hired the firm Crowe, Chizek and Company, LLC to review the Enterprise Risk Management (ERM) program at the Laboratory. The ERM is being incorporated into each process defined in the Laboratory's Management System (LMS) program.

Concerns/Issues

- Selection of the next Laboratory Director as soon as possible will help implement the initiatives resulting from the on going strategic planning and help to stabilize the Laboratory organization.

Assessment of Objective 4.3:

Based on performance measure results and the additional information provided above, ASO assigns the grade of A.

Summary Assessment for Goal 4:
Argonne has demonstrated improvement in the leadership of the Laboratory, however, while some key leadership roles were strengthened, other key positions still require stable leadership. Replacement of the Laboratory Director will play a significant role in defining the lab's future leadership.

During the FY08 performance period, the Laboratory has improved in the area of strategic planning and vision; and progress has been made in the area of Nuclear Footprint Reduction and nuclear safety compliance. Both of these were noted as issues in FY07; and both have the ability to impact long-range planning and future commitment for the Laboratory.

An increase in Corporate Office attention and support has been noted, especially in the area of chartering oversight committees to address some of the Laboratory's more significant issues (e.g., ES&H and strategic planning). It is expected that recommendations from these committees will continue to benefit Laboratory operations.

Given the above, ASO assigned an overall rating for Goal 4 of B+.

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
4.0 Effectiveness and Efficiency of Contractor Leadership and Stewardship					
4.1 Provide a Distinctive Vision for the Laboratory and an Effective Plan for Accomplishment of the Vision to Include Strong Partnerships Required to Carry Out those Plans	B	2.9	35%	1.02	
4.2 Provide for Responsive and Accountable Leadership throughout the Organization	B	2.9	35%	1.02	
4.3 Provide Efficient and Effective Corporate Office Support as Appropriate	A	3.9	30%	1.17	
				Performance Goal 4.0 Total	3.2/B+

Table 4.1 – Goal 4 Performance Rating Development

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Table 4.2 – Goal 4 Final Letter Grade

5.0 Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection

The Contractor sustains and enhances the effectiveness of integrated safety, health and environmental protection through a strong and well deployed system.

The weight of this Goal is 30%.

Goal 5 measured the Contractor's overall success in preventing worker injury and illness; implementing ISM throughout the organization; and providing effective and efficient waste management, minimization, and pollution prevention.

5.1 Provide a Work Environment that Protects Workers and the Environment

Accomplishments

- Performance Measure 5.1.3: Argonne exceeded the target of 14 points, earning a total of 17 points for reviews that significantly improve radiological controls and/or enhance reduction of radiation dose. The credited ALARA reviews and other radiological safety actions have resulted in several operational improvements and have reduced radiation exposures.

- Performance Measure 5.1.4: Argonne met the target of 100% of its Health Physics Procedures having been reviewed and updated, achieving an overhaul of the entire operational health physics infrastructure. There were several procedures deleted, several added and several combined to make more useable procedures.

- Performance Measure 5.1.7: Argonne exceeded expectations for air emissions – there were zero significant violations of permit conditions.

- Performance Measure 5.1.9: Argonne met the target by exceeding expectations for inspection of non-NRTL listed electrical equipment, with inspections discovering and mitigating several conditions that could've resulted in personnel injury or fire.

- Argonne successfully passed DOELAP performance testing and on-site assessments for both external and internal radiation dosimetry programs. It is expected that continuing accreditation will be awarded. Argonne has also installed a whole-body counting system to enhance internal dosimetry capabilities, and avoided significant costs by migrating to an external dosimetry system that had been excessed by another (closing) DOE site.

- Argonne eliminated two nuclear facilities, thus reducing its nuclear facility footprint by de-inventorying Bldg 205 G Wing and Vault 40. These facilities are now below HC3 thresholds and categorized as radiological. In addition, site-wide inventory has decreased via several shipments of nuclear materials (OSRP, RH-TRU) off-site.

- Improvements have been made in the implementation of 10CFR835. Examples include an enhanced Triennial Audit Plan for the Radiological Protection Program (RPP) and completion/closure of outstanding corrective actions.

- Argonne made good progress in implementing a site-wide program for nanotechnology safety. Under the safety improvement plan, the Laboratory completed 41 actions to address program implementation and also recommendations from the HSS Nanotechnology Report.

Concerns/Issues

- Performance Measure 5.1.1: Argonne achieved a Total Recordable Case (TRC) rate of 1.08, which significantly exceeded the target rate of 0.63. Argonne had focused on actions to improve

performance (safety survey, ergonomics program emphasis); however, performance during FY08 was not improved.

- Performance Measure 5.1.2: Argonne achieved a Days Away Restricted or Transferred (DART) rate of 0.49, which significantly exceeded the target rate of 0.24. The Laboratory's performance in these areas (TRC and DART) demonstrates little or no progress over the past two years, casting doubt that influential process variables are being significantly controlled, i.e. factors that will produce a cause/effect result may not be understood or well characterized.

- Performance Measure 5.1.5: Argonne had one occurrence involving unauthorized work on energized electrical circuits, and thus did not meet the target.

- Performance Measure 5.1.6: Argonne had one reportable unpermitted liquid effluent release.

- Performance Measure 5.1.8: Argonne had one high-significance exceedance of water effluent permit limits (for TDS). IEPA is considering regulatory relief for TDS exceedances, but this relief will not be applicable until it is written into the Argonne permit.

- While net progress was made in the de-inventory of nuclear facilities (as mentioned above), that effort bore an opportunity cost – it set back plans for reducing the nuclear footprint in other facilities. For example the relocation of nuclear waste material from Bldg. 205 G-Wing to Bldg. 306 made it necessary to retain Bldg. 306 as an HC3 facility indefinitely.

- Another significant problem was the unforeseen discovery that a lack of rigor in determining nuclear isotope inventories at the Bldg. 205 G & K facility resulted in a TSR violation and an increase in the hazard categorization of the K Wing facility from HC3 to HC2.

- Several deficiencies have been identified in the fire protection program, e.g., less than adequate testing of detection and alarm systems and lack of notable action on the Fire Hazard Analysis recommendations.

Assessment of Objective 5.1:

Based on performance measure results and the additional information provided above, ASO assigns the grade of C+.

5.2 Provide Efficient and Effective Implementation of Integrated Safety, Health and Environment Management

Accomplishments

- Performance Measure 5.2.1: Argonne delivered four Safety Improvement Plans: Work Planning & Control; Energized Electrical Equipment; Existing Electrical Equipment; Nanomaterials.
- Performance Measure 5.2.2: Argonne met the target by prompt and effective immediate action to mitigate high-risk items, and by presenting monthly information to ASO FRs. Further improvements in the CAS are expected (as required by the ASO approval letter) next year.
- Performance Measure 5.2.5: Argonne submitted two proposals for long-term stewardship and environmental monitoring programs as requested: to reduce groundwater monitoring and to reduce high VOC concentrations in the 317 area.
- Performance Measure 5.2.6: The integrated plan that was to be provided by Oct. 31, 2007 was replaced by ASO concurring on other Argonne tasks. Argonne submitted an Alternative Analysis Proposal and a three year plan outline. In addition, a new three year plan to define details was delivered in October 2008.
- Performance Measure 5.2.10. Argonne implemented the oak tree health plan and injected 45 trees with a soil root growth hormone, meeting the intent of the measure.

- Performance Measure 5.2.11: Argonne met both targets for control of invasive species: conducting all prescribed burns and reporting on wetlands.
- A re-verification review of Argonne's ISMS indicated that ISM is being implemented at Argonne. Numerous strengths were identified, e.g., commitment to ISM at all levels and an active management assessment program. ASO continued approval of the ISMSD. However, the Argonne ISMS does not appropriately balance the application of the following ISM principles: Line Management Responsibility for Safety, Clear Roles and Responsibilities, and Competence Commensurate with Responsibility. Other concerns include the lack of an effective Laboratory-wide Work Planning & Control process (discussed below), failing to perform some required NEPA reviews, and lack of guidance or formality in some aspects of the lessons-learned program.
- The Contractor Assurance System Description (CASD) was updated and approved by ASO. It generally satisfies the requisite ESH-related CAS elements and has certain strengths. These include management support, strong independent and management assessment programs, and a well-defined risk ranking system. Areas needing further development for continued approval include: a process to roll up and present CAS information to all levels of management, planning for Argonne-led functional area reviews, and an improved process for reporting non-conformances.
- Argonne completed its Argonne Assessments Program Description; this supports the CAS in meeting requirements of DOE O 226.1A. During FY08 Argonne conducted over 200 assessments and surveillances. Argonne has shifted primary emphasis to shorter-focused assessments, to enable evaluation of a broader range of topics, present less impact to the assessed organization, and to achieve more timely corrections. Argonne is finalizing a comprehensive search to identify all applicable assessment requirements. The ultimate goal of this and related activities is to define a "perpetual" self-assessment schedule complemented by other information sources, and to optimize their oversight program.
- Argonne has contracted with DuPont to perform a comprehensive review of Argonne's health and safety culture (including employee interviews) and provide recommendations for improvement.
- An annual RCRA Part B inspection was conducted by IEPA; no violations were identified.
- Argonne implemented the electronic Job-Hazard Questionnaire system and developed 46 new training courses.

Concerns/Issues

- Performance Measure 5.2.3: Argonne has not improved the timeliness of reporting OSHA recordable cases or ORPS reportable events. Discussion of NTS reporting within 20 days was rebuked by Argonne as not being a requirement, even though that DOE Office of Enforcement expectation is quite clear.
- Performance Measure 5.2.4: Since ASO formally expressed expectations for communication with Facility Representatives (FRs) in 2005; little to no improvement has been made. In many cases, FRs are not informed of key meetings, walkthroughs and decisions relating to ESH matters. In one attempt at improvement, EQO established and advertised a safety calendar for use by Laboratory organizations. However, after 2-3 months trial there was zero input provided by line organizations.
- Performance Measure 5.2.7: Interim nuclear safety controls for Bldg 205 were implemented, and Vault 40 was de-inventoried below the Hazard Category 3 thresholds. However, interim controls have not been finalized or implemented for Bldg 200 MA/MB, exacerbating a wide gap in nuclear safety compliance.
- Performance Measure 5.2.8: Argonne has developed a Conduct of Operations Manual, but not all facility matrices and training have been completed, and coordination between the quality assurance and nuclear operations efforts was poor.
- Performance Measure 5.2.9: Cost planning for waste, including UMCs, was reported to be incorporated into eBUD, a part of Argonne's proposal preparation, but no evidence was available and waste costs for WFO proposals are not required to be specified up front. Additionally, all funding needs (e.g. waste, safety infrastructure, UMCs, etc) do not appear to be effectively identified.

- Noncompliance with 10CFR830 remains a significant vulnerability, especially at operating nuclear facilities. None of the nuclear facilities possess a safety basis compliant with Subpart B of Part 830. Argonne has submitted a request for exemption from Subpart B for Bldg 46 (Transportation) and a Basis for Interim Operations for Bldg 205 K Wing, approval of which may represent some progress in FY 2009.
- The lack of an effective Work Planning & Control (WPC) process was self-identified by Argonne in 2006; however, to date, development of a process remains incomplete. Two hazardous chemical overexposures in 2Q FY2008 at Argonne highlighted severe gaps in the implementation of WPC and 10CFR851. The events also clearly indicated the essential non-existence of Argonne's investigation process definition or execution, delaying the identification of corrective actions deep into FY 2009. The significance of the events led to an OE investigation and consideration of enforcement action, but this issue relates to the underlying factors that researchers failed to understand that no research can be performed outside of, or without, an adequate safety review, and that this condition was tolerated.
- Argonne's effectiveness review (to develop an ISMS declaration statement) identified a need to more closely monitor completion of ESH training, since there is a substantial number of personnel whose training has expired.
- Argonne has gone through major transitions with personnel, organization, programs and procedures. Many of the changes are not at the point of completion or implementation, therefore the success of the efforts can not be determined. However the confusion of roles and responsibilities generated as a by-product is clear.

Assessment of Objective 5.2:

Based on performance measure results and the additional information provided above, ASO assigns the grade of B-.

5.3 Provide Efficient and Effective Waste Management, Minimization, and Pollution Prevention

Accomplishments

- Performance Measure 5.3.1: Argonne met the target by submitting comprehensive FY 2009 Environmental Management System objectives and targets for environmental aspects.
- Performance Measure 5.3.2: Argonne met the target activities for Land Management and Habitat Restoration (LMHR), effectively integrating LMHR work plan into the Grounds Department operations.
- Performance Measure 5.3.3: Argonne met the target by completing the requisite Pollution Prevention Opportunity Assessments (PPOA). The implemented PPOAs resulted in cost and energy savings as well as an EPA award for reduction of lead and mercury. Significant was that half of the PPOAs were conducted by line divisions, demonstrating increasing ownership by line management.
- Argonne has gained certification by the Carlsbad Field Office (CBFO) to ship both previously- and newly-packaged RH-TRU waste to WIPP for permanent disposal. Argonne is on the CBFO Ramp-Up Plan and has begun these shipments.
- Performance Measure 5.3.6: The target was met in spirit and mixed waste the treatment/disposal was maintained in the face of current generation rates.

Concerns/Issues

- Performance Measure 5.3.4: Argonne made some progress in identifying and inventorying unneeded materials and chemicals (UMC) and planning for their disposition, as well as planning for disposal of a significant backlog of low-level and mixed radioactive wastes. However, it does not appear that removal of the target 1/3 of the UMC was accomplished.
- Performance Measure 5.3.5: As indicated by Argonne's old waste recovery plan and the 4th quarter WMO report, the target was not met.

- Performance Measure 5.3.6: The target being met in spirit was counterbalanced by the necessity for an exemption to the one-year storage limitation. Additionally, progress in characterization and disposal is necessary for successful completion in FY 2009 of the three-year plan to eliminate the backlog of sub-characterized low-level radioactive waste.

Assessment of Objective 5.3:

Based on performance measure results and the additional information provided above, ASO assigns the grade of B+.

Summary Assessment for Goal 5:

There can be little doubt that Argonne has focused attention and resources on improving nuclear safety in FY 2008. Some notable and significant strides have been accomplished to reduce the risks on site by safely transferring materials out of certain facilities into others. The fact remains that the critical vulnerability of non-compliance remains – no nuclear facility possesses an acceptable documented safety basis. While efforts bore fruit in reducing the overall risk, Argonne was not able to achieve similar safety basis success in parallel with the material transfers. To some extent, the DOE Office of Science accepted this situation and informally concurred in the steps forward. It was anticipated that Argonne would be able to achieve a more balanced progress. The end-of-year caucus alluded to a good best effort, and there were many at Argonne who contributed their share and more, but ASO's evaluation is that Argonne as a Laboratory can and must achieve much more.

The efforts to improve nuclear safety may have had an opportunity cost in the degradation of laboratory safety – what is clear is that the injury and illness rates jumped, along with the financial stresses on all programs to provide support for nuclear operations. Compelling evidence is lacking to show that the variables necessary to control injury and illness rates are both known and controlled. Awareness has been raised through the "Safety Guy" tool, but further developing it to communicate and mitigate the latent organizational weaknesses that allow injuries or illnesses has not occurred.

The electrical safety inspection process for non-Nationally Recognized Testing Laboratory equipment has been a bright spot in both the volume and rigor of the inspections, with many instances of possible fire or electric shock being prevented by the inspectors' intervention. ASO looks forward to the declaration by Argonne that all non-NRTL equipment on site has been inspected and mitigated, that all equipment entering the site is inspected, and that the expertise and professionalism developed through this effort is being maintained.

There was steady progress in meeting DOE expectations in the environmental arena – this and some progress improving nuclear safety prevented further decay of the rating for this goal compared to FY 2007. Some long-standing un-met environmental expectations were met, and ASO anticipates continued progress in FY 2009. Serious challenges persist at the systems level in that the ISMS, EMS and CAS implementations are passable but far less than superlative. Additionally, as the nuclear materials footprint is reduced, adding effort in packaging and transportation must not be allowed to displace commitments to characterize and dispose of wastes generated prior to 2007.

ASO assigned an overall rating for Goal 5 of B.

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
5.0 Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection					
5.1 Provide a Work Environment that Protects Workers and the Environment	C+	2.4	25%	0.60	
5.2 Provide Efficient and Effective Implementation of Integrated Safety, Health and Environment Management	B-	2.7	50%	1.35	
5.3 Provide Efficient and Effective Waste Management, Minimization, and Pollution Prevention	B+	3.4	25%	0.85	
Performance Goal 5.0 Total					2.8/B

Table 5.1 – Goal 5 Performance Rating Development

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	**A+**	**A**	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D**	**F**

Table 5.2 – Goal 5 Final Letter Grade

6.0 Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission(s)

The Contractor sustains and enhances core business systems that provide efficient and effective support to Laboratory programs and its mission(s).

The weight of this Goal is 25%.

Goal 6 measured the Contractor's overall success in deploying, implementing, and improving integrated business system that efficiently and effectively support the mission(s) of the Laboratory.

6.1 Provide an Efficient, Effective, and Responsive Financial Management System(s)

Accomplishments

- Argonne synchronized the Financial System allowing for more accurate and timely reporting across all divisions.
- Presented travel workshops on Get There to provide information and promote on-line booking of travel which is significantly less expensive than agent bookings.
- Began the implementation of an Enterprise Risk Management program at the Laboratory in conjunction with LMS efforts.
- Designed and implemented the assessment of IGPP and IGPE indirect expense in February, retroactive to October 1st.
- Argonne's commitment to a strong internal controls environment provides further evidence that financial management policies and procedures are followed diligently and assures the integrity of Argonne's financial systems.

Concerns/Issues

- During FY08, the Chicago Operations Review identified twenty-one occurrences of insufficient advances for proprietary work.

Assessment of Objective 6.1:

Based on performance measure results and the additional information provided above, ASO assigns the grade of A-.

6.2 Provide an Efficient, Effective, and Responsive Acquisition and Property Management System(s)

6.2.1 Acquisition System

Accomplishments

- The Argonne Acquisition System met or exceeded 19 of 20 Procurement Balanced Scorecard Measures (PBSC) during the FY08 performance period.
- Argonne Materials Ordering System (AMOS) continues to be further developed/expanded with new vendors.
- The DOE/Contractor Procurement Evaluation and Review Team performed an assessment of the Argonne Acquisition System, which resulted in positive findings. Eighteen areas overall were noted as "strengths", and PARIS was noted as a "best practice". Argonne continues to be a leader amongst SC Laboratory's in the Acquisition Management area.

Concerns/Issues

- None noted.

6.2.2 Property Management System

Accomplishments

- Exceeded 18 of 19 FY 2008 performance measures.
- In excess of $26 M in cost savings achieved through reutilization efforts and an additional ~$540k through the use of the DOE precious metals pool.
- Implemented an aggressive measure to aid in controlling lost/stolen laptop computers and other property – a "financial liability" may be imposed on employees for damage or loss to property or equipment.
- Implemented an aggressive policy for the control of fuel usage.

Concerns/Issues

- Outstanding issues remain in the vehicle/fleet management system, thus limiting DOE's ability to grant unconditional approval of Laboratory's Personal Property Management System.
- GSA Accident – Unofficial use of Government Vehicle.

Assessment of Objective 6.2:

Based on performance measure results and the additional information provided above, ASO assigns an overall grade of B+.

6.3 Provide an Efficient, Effective, and Responsive Human Resources Management System

Accomplishments

- Human Resource Management and Diversity Program met or exceeded 12 out of 12 Balanced Scorecard measures.
- Argonne continues to strife to make cost saving changes in several areas of their overall benefits program, i.e. employer/employee premium shares, Flexible Spending Accounts, Health Benefits (and related administrative fees), Life Insurance, Rx costs; while maintaining a program that is competitive with that of the private sector and other national laboratories and meets the needs of their employees in a manner that supports preventative medicine.
- The Argonne Medical Director was elected chairperson of the Occupational Medicine Subgroup of Energy Facilities Contractors Group (EFCOG) by peer Site Occupational Medical directors. This subgroup of EFCOG is dedicated to ensuring a safer and healthier workforce in the DOE Complex.
- Argonne received recognition from several sources as being one of the best places to work for both minority engineers and women engineers.

- Argonne is part of a consortium that launched the most comprehensive website in Chicago area for jobs at colleges and universities, and research, medical and cultural centers. The free, web-based search engine includes listings for both faculty/scientific and staff jobs. The site began in October 2007 and it will be useful in the future to track outcomes.

- The Laboratory has continued to benefit from the Argonne Outreach Team initiative by utilizing scientists and engineers in diversity-related outreach and recruitment.

- The Laboratory continues to focus on expanding opportunities to make science more visible to minority and female students by hosting various events during the year; i.e., Science Careers in Search of Women Conference; Introduce a Girl to Engineering Day; other events hosted by the diversity-related affinity groups.

Concerns/Issues

- None noted.

Assessment of Objective 6.3:

Based on performance measure results and the additional information provided above, ASO assigns the grade of A-.

6.4 Provide Efficient, Effective, and Responsive Management Systems for Internal Audit and Oversight; Quality; Information Management; and Other Administrative Support Services as Appropriate

6.4.1 Internal Audit and Oversight

Accomplishments

- The Internal Audit Department performs three basic activities within the laboratory: (1) planning and completion of internal audits, (2) serves as liaison with external audit organizations working at Argonne, and (3) oversight on the implementation of audit recommendations as required in a Prime Contract performance measure.

- The performance of internal audits adheres to an annually prepared Internal Audit Plan. The Plan is developed using a financially oriented risk assessment methodology advocated by the DOE Office of Inspector General (OIG). The assessment process involves the subjective assessment of risk based upon the following six factors:

    1. Quality of internal controls, system complexity, and transaction volume.
    2. Financial exposure, materiality, and asset liquidity.
    3. Prior audit results.
    4. Regulatory environment.
    5. Potential for unallowable costs.
    6. New or changed system.

- The assessment process includes both activities identified by the OIG and those suggested by laboratory management and the DOE Argonne Site Office.

- No exceptions occurred on any of the measure requirements for the twelve month period ended September 30, 2008. The Fiscal Year 2008 performance results from the following specific accomplishments:

- 58 recommendations were fully implemented within Argonne management defined time periods with no extensions having been made.
- All recommendations had corrective action initiated within 45 days of audit report receipt.

- Successful liaison activity primarily involves communication with all levels of laboratory management on audits planned by external audit organizations (primarily the OIG).
- Argonne's Internal Audit function to be an independence effective audit function.

Concerns/Issues

- None noted.

6.4.2 Information Management

Accomplishments

- Alignment of Approved Chief Information Officer Development Fund (CDF) Projects with Laboratory Goals.
- The Laboratory had 11 CDF projects that were approved for funding for FY 2008. All of the projects are tightly aligned with the goals of the Digital Laboratory Initiative for Business Systems and Information Management, Sharing and Collaboration. All of the CDF projects that were completed for FY2008 were completed within budget and schedule.
- Initiation of Innovative Technology - Select and evaluate/pilot the use of innovative technology to assist in the successful achievement of Laboratory goals. Examples include Voice-over-IP, incorporation of all laboratory network assets into an Integrated Host Warehouse, Improvement of the Laboratory Intranet, Improvement of Central Authentication and Authorization Services.
- The Laboratory for FY2008 has identified several innovative candidate technologies that align with the Digital Laboratory Initiative for Business Systems. The technologies were piloted and bench-marked by IM to engage a diverse group of stakeholders throughout the Laboratory. One of the technologies piloted by IM was the Web based conferencing services (Adobe Connect) which has gained in popularity and has proven very successful. The technology has proven to be a more efficient and effective process for the laboratory to conduct business. Several of the other technologies which have been initiated by the Laboratory/IM for FY2008 were ISSAC (universal roles and responsibilities), Gate Security Barcode Reading (telephone record of security vehicle searches), Xink form generation (brings 1000+ paper forms to the web), Electronic workflow and routing/ e-signature, Nemo notification system, Cyber gate pass and FabLab. All of these technologies/innovations have proven to be a more efficient and effective method for the laboratory to conduct business

Concerns/Issues

- None noted.

6.4.3 Communications and Trust:

Accomplishments

- Prior to the beginning of the grading period, DOE negotiated a series of five measures and an accompanying number of targets. Through the first half of the fiscal year, there was little progress toward accomplishing several of the long-term strategic goals and DOE identified the significant shortcomings at mid-year…specifically the lack of a comprehensive communications plan and the lack of a crisis communications plan. Since that mid-year report, new leadership in the functional C&PA group and a new focus in the Lab's Directorate has succeeded in maintaining the lab's progress in its tactical, day-to-day public affairs activities while also addressing the long-term PEMP requirements for a comprehensive plan and a crisis management plan. During that same six-month period, the lab's C&PA group and lab management also made significant progress toward establishing and operating a Brand Management Council to bring to fruition the promise of the Lab's stalled branding effort.

- It should be noted here that the lab management reorganized the reporting arrangement for the C&PA group during the rating period. In the past, this group reported to the Lab Directorate (the Deputy Director or others) and now it has been reorganized to report to the Chief Operating Officer. This is an organizational structure which has not served the lab well in the past.

- As was pointed out during the Assessment meetings with the Lab, DOE has an expectation that the Lab's comprehensive communications plan will soon be delivered to the Lab management, it will be approved by lab management and then the lab as a whole will dynamically execute the comprehensive plan. DOE and elements of the Lab management have given completion and execution of this comprehensive plan special emphasis because it is a critical element in forging a cohesive communications effort to accomplish two goals: realization of the concept of One Argonne, and, critical support for the communications goals of DOE's Office of Science.

Concerns/Issues

- None noted.

6.4.4 Legal Management

Accomplishments

- In the area of Non-Compliances, the Argonne Legal Department has had no major or minor finding of non-compliance during the FY08 performance period.
- Laboratory-generated data has been appropriately managed and protected. Argonne Legal Department plays a significant role in the success and facilitation of Technology Transfer.
- Argonne Legal Department is expected to provide sound legal advice to support the Laboratory' broad spectrum of operational activities. There have been no issues identified in this area.

Concerns/Issues

- None noted.

6.4.5 Counterintelligence

Accomplishments

- The Argonne Office of Counterintelligence performed an assessment of all twelve sub-programs and found no issues.
- Argonne Site Office operational awareness and communications with the Argonne Office of Counterintelligence further supports a well managed and effective Laboratory CI program.

Concerns/Issues

- None noted.

Assessment of Objective 6.4.:

Based on performance measure results and the additional information provided above, ASO assigns an overall grade of A-.

6.5 Demonstrate Effective Transfer of Technology and Commercialization of Intellectual Assets

Accomplishments

- Licensing activities resulted in significant transfer of technology into commercial use and substantial royalty return to Argonne.
- A large biochip patent portfolio was characterized adding to Argonne's patent portfolio.
- Customer satisfaction remains high with an average score of 4.48 out of 5.
- Argonne was recognized with two of the world's top 100 scientific and technological innovations by R&D Magazine, and received special recognition from the Federal Laboratory Consortium for excellence in transferring technology to industry.
- Argonne's Technology Transfer Division received a competitive award of $700,000 in funding from EERE for technology commercialization activities.
- Argonne has developed the Argonne Venture Acceleration Consortium to work more closely with Venture Capital firms in the Chicago area.
- It is noted that issues raised in the FY 08 third quarter assessment have been satisfactorily addressed. These related to a drop in the quality of WFO research proposals and timeliness of processing incoming interagency agreements. New staff which are now better trained and participation in a WFO Process Improvement Team have helped to ameliorate the problems.

Concerns/Issues

- None noted.

Assessment of Objective 6.5:

Based on performance measure results and the additional information provided above, ASO assigns the grade of A.

Summary Assessment for Goal 6:

Goal 6 encompasses several key management systems. During FY 2008, Argonne has worked on re-establishment of key management systems (Acquisition/Procurement, Compensation, and Property Management). For the most part, DOE, with the Laboratory's cooperation have made substantial progress in review and approval of these key management systems.

In the work for others and technology transfer area, Argonne continues to develop its programs to further support the mission of the Laboratory and enhance technology transfer.

Based on performance measure results and the additional information provided above, ASO assigns the grade of A-.

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
6.0 Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission(s)					
6.1 Provide an Efficient, Effective, and Responsive Financial Management System(s)	A-	3.6	20%	0.72	
6.2 Provide an Efficient, Effective, and Responsive Acquisition and Property Management System(s)	B+	3.1	20%	0.62	
6.3 Provide an Efficient, Effective, and Responsive Human Resources Management System	A-	3.6	20%	0.72	
6.4 Provide Efficient, Effective, and Responsive Management Systems for Internal Audit and Oversight; Quality; Information Management; and Other Administrative Support Services as Appropriate	A-	3.7	25%	0.93	
6.5 Demonstrate Effective Transfer of Technology and Commercialization of Intellectual Assets	A-	3.6	15%	0.54	
				Performance Goal 6.0 Total	3.5/A-

Table 6.1 – Goal 6 Performance Rating Development

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Table 6.2 – Goal 6 Final Letter Grade

7.0 Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs

The Contractor provides appropriate planning for, construction and management of Laboratory facilities and infrastructures required to efficiently and effectively carry out current and future S&T programs.

The weight of this Goal is 20%.

Goal 7 measured the overall effectiveness and performance of the Contractor in planning for, delivering, and operations of Laboratory facilities and equipment needed to ensure required capabilities are present to meet today's and tomorrow's complex challenges.

7.1 Manage Facilities and Infrastructure in an Efficient and Effective Manner that Optimizes Usage and Minimizes Life Cycle Costs

7.2 Provide Planning for and Acquire the Facilities and Infrastructure Required to support Future Laboratory Programs

The ASO evaluation of the Argonne Facility and Infrastructure (F&I) Performance is based on objective data directly related to the F&I Performance Measure, as well as objective and subjective input that comes from a variety of sources, such as the ASO observations, program and project audits, inspections, and reviews, various operational awareness activities, and routine performance and periodic status reports such as the Argonne Mid-Year Report. The Argonne FY08 Self-Assessment is another source of information that ASO considered in its evaluation of Argonne FY08 F&I Performance.

Accomplishments

- Argonne has continued to lead the SC complex in effective management and stewardship of the infrastructure demonstrated by meeting and exceeding SC FY 2008 Management Investment Index target, as well as continuing to participate in new Departmental and SC infrastructure related initiatives.

- Argonne incorporated two new SC approaches into their infrastructure planning processes this FY, even though they were not scheduled to be implemented until FY09. Argonne used the Mission Readiness Process approach for developing the infrastructure section of the Annual Laboratory Plan and Refined the long-range campus plan to incorporate program vision and output from the process. In addition, Argonne Instituted IGPP program to address some critical infrastructure needs, including electrical distribution improvements that were part of a cancelled line-item project.

- ASO recognizes the efforts of OPM to use the OPM3 assessment tool to measure the effectiveness of its project management system. ASO believes this approach to assess system maturity, combined with bench-marking industry best practices, and implementing a prioritized list of government initiatives, will assist in achieving a "best in class" system. In addition, the Office of Project Management's commitment to professional excellence is demonstrated by the fact that all Project Managers have attained their Project Management Professional certification with the Project Management Institute.

- The Laboratory developed a CD-0 package for a new $95 million Energy Sciences Building (ESB) in compliance with the Laboratory's modernization plan and the ten year site plan. DOE requested the Life Cycle Cost Analysis (a CD-1 requirement) be completed prior to year end and the Lab responded by completing the document. CD-0, Approval of Mission Need has now been signed by DOE.

- The Building 301 Decontamination and Demolition project is performing well in line with performance expectations both for cost and schedule. Many unforeseen challenges have been overcome and the project is performing very well. The demolition contract has been awarded with the potential for significant cost savings approaching a million dollars for the project.

- The RH-TRU project was re-baselined and is performing well, initiating RH-TRU shipments to WIPP. Argonne was only the second facility approved for shipments to WIPP. Five shipments have been sent to date and four additional shipments are currently pending.

- During the year, Argonne developed a site-wide facility disposition plan, including a detailed Transition Plan for IPNS closure and cost estimate for the D&D of the complex and CD-0 packages to support the transfer of facilities to EM. Argonne's responses to the multiple data calls and HQ visits as well as its successful execution of the current EM scope resulted in EM acceptance >90% of the proposed projects and identification of one of the cleanup projects as the top priority. These proposals will ultimately enable execution of the complete Laboratory Modernization Plan by providing funding for decontamination and demolition of these facilities.

- In support of the Goals of the DOE's Transformational Energy Action Management (TEAM) Initiative, Argonne successfully completed the implementation of 2nd ESPC project ; initiated a 3rd Delivery Order and developed a comprehensive TEAM executable plan incorporating a self sustaining in house energy management program

- Argonne continued to Improve Management Systems for Effective Infrastructure Planning, Management and Execution by identifying and implementing various cost savings/productivity improvements which resulted in additional infrastructure management funds (approx. $2M).

- Participated in beta-test of DOE initiative regarding High Performance Sustainable Buildings (HPSB). Several of Argonne's suggestions for the improvement of the tools developed for the initiative were accepted by the DOE developer. Developed and verified tables of facilities for the Argonne Portfolio Compliance Summary base on the HPSB assessment guidelines.

- The Infrastructure Planning and Review Board (IPRB) was established to assure that all facility related work beyond the scope of normal operating activities that requires funding through the Laboratory ESH&I Prioritization process or from any other source, has an appropriate scope of work and is prioritized to maximize the utility of limited available resources

- With implementation of the Engineering staffing plan completed, the Facility Systems Engineer (FSE) program is in place (previously referred to as CSE). This program integrates systems engineering with the establishment of the IPRB and establishment of programs to evaluate and prioritize the infrastructure needs related to roofs, roads, elevators, etc. The FSE's perform the required annual condition assessment program CAS.) in-house at a substantial savings compared to previous use of outside contractors while retaining the facility knowledge within the Laboratory. The Facility Systems Engineering (FSE) Program implemented in FY08 resulted in the increased reliability of facility systems (i.e., electrical distribution, heating and ventilation systems).

- At the completion of the feasibility study for the implementation of co-generation at Argonne at the end of FY07, Argonne developed an action plan, with discreet milestones for moving the initiative to a logical conclusion. All milestones from in the action plan were completed this FY (Central Plant Modernization Study; a detailed Central Plant Life Cycle Cost Alternatives Analysis; and Plan and Permit Application to Burn Renewable Fuels in Boiler #5). These efforts resulted in a path forward to evaluate use of renewable fuels in an existing boiler, while concurrently developing a project to install a Combined Heat and Power combustion turbine for improved energy efficiency and emissions reduction.

Issues

- None noted.

Summary Assessment for Goal 7:

In FY 2008 the Laboratory made significant accomplishments in sustaining excellence in operating, maintaining, and renewing the facility and infrastructure portfolio to meet Laboratory needs. The initiatives successfully undertaken during the course of the year were focused on a) development of innovative strategic plans to address the aging infrastructure, b) improvement of management systems for effective execution of projects, c) streamlining of work processes for more effective utilization of resources and improved customer service, and d) reduction of energy and water resources consumption. Overall performance in this area exceeds expectations and is rated at the A- level.

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
7.0 Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs					
7.1 Manage Facilities and Infrastructure in an Efficient and Effective Manner that Optimizes Usage and Minimizes Life Cycle Costs	A-	3.6	45%	1.62	
7.2 Provide Planning for and Acquire the Facilities and Infrastructure Required to support Future Laboratory Programs	A-	3.6	55%	1.98	
				Performance Goal 7.0 Total	3.6/A-

Table 7.1 – Goal 7 Performance Rating Development

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Table 7.2 – Goal 7 Final Letter Grade

8.0 Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems

The Contractor sustains and enhances the effectiveness of integrated safeguards and security and emergency management through a strong and well deployed system.

The weight of this Goal is 10%.

Goal 8 measured the Contractor's overall success in safeguarding and securing Laboratory assets that supports the mission(s) of the Laboratory in an efficient and effective manner and provides an effective emergency management program.

8.1 Provide an Efficient and Effective Emergency Management System

Accomplishments

- The Emergency Operations Center was activated for three events, which were managed below an operational emergency, one of which was accepted as the annual exercise.
- Emergency Operations Center personnel participated in increased training tempo and the Laboratory hosted a successful joint FBI/DOE Weapons of Mass Destruction ("Silent Thunder") tabletop exercise in Feb 2008.

Concerns/Issues

- Formal Emergency Planning Hazards Surveys/Assessments languished in planning status (required by DOE Order 151.1C).

Assessment of Objective 8.1:

Based on performance measure results and the additional information provided above, ASO assigns the grade of B-.

8.2 Provide an Efficient and Effective System for Cyber-Security

Accomplishments

- Argonne National Laboratory's Cyber Security Program significantly exceeded expectations in FY 2008. The overall Program continues to be a model for the DOE complex. In detail, the Program continues to push the boundary of cyber security in the areas of early detection by identifying new vulnerabilities. This has been accomplished by developing corresponding methods to detect and close them, along with innovative models (Federated) for the Office of Sciences.
- Minimize network vulnerabilities and promptly correct vulnerabilities detected by either network scans. For FY 2008 Argonne has implemented several improvements to its scanning regime: they continue to use the Nessus scanning product and its ability to perform real-time scanning of new hosts along with weekly scans of key systems and comprehensive annual scans of all hosts to identify and address all high and medium vulnerabilities. The real-time scanning capability is particularly noteworthy as hosts are now scanned for the most common vulnerabilities as soon as they appear as opposed to being scanned only annually.
- Timely Response to Cyber-Security Intrusions. The Laboratory has demonstrated its ability at early detection of vulnerabilities. This measure sought to insure that Argonne promptly investigated and reported cyber security incidents once detected. The CSPP/Lab Policy indicates

that 4 hours be a standard for intrusions detection/reporting. During FY 2008, twenty eight incidents occurred which needed to be reported to CIAC. Twenty two of the twenty eight incidents were used in determining Argonne's timely notification to CIAC. The remaining six incidents involved missing laptops computers. The incident records show that the Cyber Security Program Office (CSPO) reported 80% of its incidents to CIAC in less than 12 hours, 5% were reported within 12-24 hours and 14% fell in the > 48 hours. Although approximately 20% of the incidences did not fall within the 4 hour reporting timeframe, the laboratory detected and mitigated the intrusions/vulnerabilities which when balanced against the reporting requirement is the greater priority of the two.

- Divisional Cyber Security Procedures and Practices Documentation. The CSPO has developed a C&A Documentation database to store policies, procedures and practices for Laboratory and divisional cyber security programs. The database is organized based on NIST 800-53 guidance and each of the detailed requirements has been populated with the Laboratory's stance on the requirement. The CSPO works with the divisions to create supplemental documents which are division specific based on this database. This process tailors the C&A package to be more divisional specific/friendly and creates ownership by the CS Administrators.

Concerns/Issues

- None noted.

Assessment of Objective 8.2:

Overall Argonne National Laboratory's Cyber Security Program has notably exceeded expectations for FY2008. They have addressed major concerns detailed in the Mid-year performance review and they have shown creativity and innovations related to the proposal for a Federated Model of Cyber Security for the Office of Science.

Based on performance measure results and the additional information provided above, ASO assigns the grade of A.

8.3 Provide an Efficient and Effective System for the Protection of Special Nuclear Materials, Classified Matter, and Property

Accomplishments

- ANL has exceeded expectations in the protection and reduction of nuclear materials. The DOE Offsite Source Recovery Program (OSRP) and shipping of materials for consolidation provided long term cost savings to DOE and the Laboratory.

Concerns/Issues

- None noted.

Assessment of Objective 8.3:

Based on performance measure results and the additional information provided above, ASO assigns the grade of A-.

8.4 Provide an Efficient and Effective System for the Protection of Classified and Sensitive Information

Accomplishments

- No incidents of unauthorized disclosure, loss, or potential loss of confidential matter.
- 100% of site visitors from sensitive countries receive full review prior to approval.
- No unresolved unauthorized entries.
- No failures within the Physical Security alarm testing maintenance program.

Concerns/Issues

- None noted.

Assessment of Objective 8.4:

Based on performance measure results and the additional information provided above, ASO assigns the grade of B+.

Summary Assessment for Goal 8:

Within the areas of Cyber-Security, Protection of Special Nuclear Materials, Classified Matter, and Property, and Protection of Classified and Sensitive Information, Argonne is meeting and in most cases, exceeding expectations. This is especially true of the Cyber-Security area, where Argonne has assumed a leadership role in assisting the Department to further develop its Laboratory cyber program.

Based on the achievements above, ASO assigns the rating of grade of a B+.

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
8.0 Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM)					
8.1 Provide an Efficient and Effective Emergency Management System	B-	2.6	25%	0.65	
8.2 Provide an Efficient and Effective System for Cyber-Security	A	4.0	25%	1.00	
8.3 Provide an Efficient and Effective System for the Protection of Special Nuclear Materials, Classified Matter, and Property	A-	3.7	25%	0.93	
8.4 Provide an Efficient and Effective System for the Protection of Classified and Sensitive Information	B+	3.4	25%	0.85	
				Performance Goal 8.0 Total	3.4/B+

Table 8.1 – Goal 8 Performance Rating Development

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Table 8.2 – Goal 8 Final Letter Grade

Attachment I

HQ Program Office Evaluations

Office of Science
U.S. DEPARTMENT OF ENERGY

Laboratory Year-End Performance Assessment Report

Date: 11/5/2008

Headquarters Program Office Fiscal Year 2008 Evaluation of UChicago Argonne, LLC for Management and Operation of the Argonne National Laboratory

Agency:
Department of Energy - Office of Science

Program Office:
Office of Advanced Scientific Research

FY Funding Level: (Budget Authority)

Evaluator:
[redacted]

Phone Number:
[redacted]

E-mail Address:
[redacted]

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

Goal Score: 3.61 Goal Grade: A-

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 1.0 Performance Summary Statement:

ANL continues to play a key role in ASCR research efforts with many significant contributions to applied math, computational science, computer science, distributed computing, and high performance computing (HPC). ANL is hugely influential in programming models for leadership computing (e.g. MPI, p4 parallel programming library, MPICH2, PVFS2) with important advances in FY08 . These efforts also form the core of the DARPA HPCS software effort. ANL is also a recognized leaders in optimization - a research area that was identified as underpinning success for many of the Department's activities. ANL also plays a leadership role in several SciDAC efforts and has produced a leader for the emerging DOE basic research in cyber security community.

Objective 1.1 Science and Technology Results Provide Meaningful Impact on the Field

Score: 3.7 Grade: A- Weighting: 40

Objective 1,1 Performance Summary Statement:

ANL research plays a critical role in the ASCR portfolio and ASCR has very high expectations for this program. However, ANL has, in FY08, delivered some results that exceeded ASCR's high expectations.

- ANL's Portable, Extensible Toolkit for Scientific computation (PETCs) was recognized as a Top Ten Recent Breakthroughs in Computational Science and Enabling Technologies" supported by ASCR, as determined by an external panel of experts in FY08.
- ANL deployed a major new release of Cobalt in FY08. Cobalt is an open source platform for HPC system software research that enables rapid reconfiguration of components, permitting exploration of many interlinked system management issues. Cobalt also makes porting and adapting code to new platforms and system models relatively easy. But the most dramatic feature of the new release is Cobalt's increased scalability — up to 500 teraflop/s on the IBM Blue Gene/P.
- A team of researchers led by [redacted] of ANL and [redacted] of Virginia Tech received first place in an international competition for the most effective approach in using large-scale storage for high-performance computing. The award was presented November 15 at the SC07 conference. Using a novel software framework for distributed I/O called ParaMEDIC, the team of researchers from Argonne National Laboratory, Virginia Tech, and North Carolina State University searched the sequences of all completed microbial genomes against each other.
- Members of the Mathematics and Computer Science Division at ANL received three best paper awards at major international meetings in the Summer of FY06.
- ANL researchers made significant contributions to the high energy physics STAR experiment to leverage virtualization in distributing STAR applications.
- ANL developed a method for analyzing the performance of such derivative-free algorithms with surprising results that the model-based solvers performed better than geometry-based solvers, even for noisy and piecewise-smooth problems.
- The PETSc toolkit now supports the Zoltan parallel partitioning and load balancing toolkit as an external library. Zoltan's hypergraph partitioner can be used to partition meshes, thereby improving load balance and reducing communication in large-scale, parallel applications using unstructured meshes in PETSc.
- ANL developed an Automatic Dynamic Load Balancing (ADLB) library for use in SciDAC's Universal Nuclear Energy Density Function (UNEDF) project. One of the aspects of the UNEDF work will be to use the Argonne Green's Function Monte Carlo (GFMC) program to compute properties of carbon-12 using Argonne's Blue Gene/P.
- ANL developed a technique, which was implemented in the Globus Toolkit 4.1.2 release in FY08, to speed up file transfers that has proven useful to researchers in Argonne's Advanced Photon Source for transferring beamline users' data in near-real time.

Objective 1.2 Provide Quality Leadership in Science and Technology

Score: 3.8 Grade: A Weighting: 30

Objective 1.2 Performance Summary Statement:

ANL research plays a critical role in the ASCR portfolio and has, in FY08, played a leadership role in key areas that exceeded ASCR's very high expectations in FY08.

ANL is playing a very significant role in the emerging Cyber security community with [redacted] stepping in at a critical point and providing strong leadership and direction for the grass roots effort.

In Applied Mathematics, ANL focuses on optimization and has a world leading team that are clearly the very best in the U.S. as demonstrated by their performance in a highly competitive new solicitation in this area in FY08. Standouts are [redacted], and [redacted].

- [redacted] produced 15 publications in FY08 in an array of top journals.

In Computer Science, ANL researchers are recognized leadership in high performance file systems, programming models and distributed computing. Standouts are [redacted] and [redacted].

In SciDAC, ANL researchers are assuming leadership roles in many projects - most significantly [redacted] in UNEDF, [redacted] in accelerator R&D, [redacted] in visualization and [redacted] in distributed computing.

- In FY08, ANL's [redacted] was recognized as one of the top three most influential computer scientists worldwide, according to the h-index, a method for ranking scientists based on the number of papers they publish and citations they receive, [redacted] ranks third with a score of 67.

Stevens played a leadership role in chairing the 2008 SciDAC conference and in organizing the international computer science research community to address the needs of extreme scale computing.

Objective 1.3 Provide and Sustain Outputs that Advance Program Objectives and Goals

Score: 3.4 Grade: B+ Weighting: 15

Objective 1.3 Performance Summary Statement:

ANL work in all of the ASCR core research areas provide sustained efforts and world leading groups that are critical to the continued success of our program. The quality and quantity of projects and researchers and pace of progress continues to meet ASCR's very high expectations and delivers results for ASCR and for our partner programs. Argonne Applied Mathematics and Computer Science Research PIs published over 25 peer-reviewed papers in journals including Journal of Fluid Mechanics, Journal of Computational Physics, and International Journal of High Performance Computing Applications. Particularly noteworthy was ANL's [redacted] who alone had 15 publications in FY08 in an array of top journals.

Objective 1.4 Provide for Effective Delivery of Products

Score: 3.2 Grade: B+ Weighting: 15

Objective 1.4 Performance Summary Statement:

The quantity and quality of the ANL program in ASCR core research is especially strong in key areas both in terms of publications and continued progress as meets ASCR's high expectations for Argonne research.

ANL's optimization team garnered especially strong comments and thus fared a bit better than expected in the highly competitive new solicitation in this area in FY08. In addition, ANL performed very well, but as expected of such a strong group, in a highly competitive FY08 solicitation in Fast Operating Systems.

ANL Software is made available via open source in a timely manner with documentation and support.

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operation of Research Facilities

Goal Score: 3.51 Goal Grade: A-

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 2.0 Performance Summary Statement:

In July, the Argonne Leadership Computing Facility (ALCF) successfully completed their final project milestone in the ALCF project, on cost, within scope and ahead of schedule. Additionally, the 100 Teraflop IBM Blue Gene/P was transitioned to operations and the ALCF supported 20 Innovative and Novel Computational Impact on Theory and Computation (INCITE) projects. Over the past year, the lab overcame challenges that arose from a lack of communication with IBM and the Office of Advanced Scientific Computing Research (ASCR) and a lack of senior staff. The ALCF success was due in large part to the high quality of the project staff and the oversight of the Federal Project Director.

Objective 2.1 Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)

Score: NA Grade: NA Weighting: 0

Objective 2.1 Performance Summary Statement:

Objective 2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components (execution phase, Post CD-2 to CD-4)

Score: 3.4 Grade: B+ Weighting: 15

Objective 2.2 Performance Summary Statement:

Early in the construction or installation phase of the project, IBM encountered problems with their chip design. Argonne and ALCF staff worked with IBM to diagnose the problem. At this time the ALCF chose not to fully inform ASCR of these problems in a timely matter. Once ASCR staff expressed their concerns about the success of the project, the ANL lab director replaced the ALCF director with [redacted].

[redacted] has worked diligently to increase ASCR's confidence in the success of the project by rebuilding communications with ASCR and IBM. Further he worked with IBM to find an acceptable solution for the chip problem. As noted above the level 1,100 Teraflop machine milestone was met on schedule, scope and within cost. In July, the final level 1 milestone, to install an additional 443 Teraflops of IBM Blue Gene/P was completed within scope and cost and ahead of schedule.

[redacted] has taken ES&H issues very seriously. For example he immediately stood down the facility

when notified by IBM that in rare cases a failed power supply could pose a safety risk if installed incorrectly, without proper grounding. Working with the IBM, an Argonne electrician and their ES&H representative, the team confirmed that the power supplies were installed correctly and the staff allowed to return to work.

Objective 2.3 Provide Efficient and Effective Operation of Facilities

Score: 4.0 Grade: A Weighting: 75

Objective 2.3 Performance Summary Statement:

Given the short time they have been in operation and the limited staff, the ALCF has exceeded expectations for a new facility. The Operational Assessment (OA) review team convened in August, 2008 to establish the ALCF operational baseline found that the ALCF is "proving of benefit to all stakeholders including the Office of Science" and that "good science has already been accomplished on the new architecture." Three of the top ten scientific advancements as identified by a panel of experienced computational scientists were enabled by resources at the ALCF.

In February, 2008, the Office of the Inspector General (IG) initiated an audit of the Office of Science's Innovative ad Novel Computational Impact on Theory and Experiment (INCITE) program. Since 80% of the computing resources at the ALCF are allocated through the INCITE program, the IG auditors reviewed the ALCF policies and procedures. The policies and procedures put into place by staff at ANL, particularly Bair and Dave were instrumental the IG's conclusion that there no material weakness within INCITE and terminated the audit.

Even though understaffed, the ALCF Scientific support staff or catalysts guided by [redacted], the new Director for Science, are providing timely responses to DOE requests for scientific accomplishments and excellent assistance to their user community. For example by redesigning a post-processing algorithm in a cardiac simulation code, the catalysts were able to drop the time to extract data from 600 seconds to 1 second. They were also able to grow the maximum problem size by 16 through other algorithm improvements.

As an example of careful financial management, the decision to do self-maintenance on parts of the facility, such as compute nodes and disk systems resulted in a savings of about $1M.

Objective 2.4 Utilization of Facilities to Grow and Support Lab's Research Base and External User Community

Score: 3.7 Grade: A- Weighting: 10

Objective 2.4 Performance Summary Statement:

Several new INCITE submissions identified Argonne's Leap to Petascale workshop as a key factor in their decision to apply for INCITE at the ALCF. The effectiveness of the ALCF's outreach to the both their internal lab researchers and the external scientific community is evidenced by the fact that requests for INCITE time at ANL grew from 240M hours for 2008 to over one Billion hours for 2009.

There is a concern within ASCR that the ANL is still too focused on growing facility resources rather than growing its staff to support its user base.

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Goal Score: 3.04 Goal Grade: B

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 3.0 Performance Summary Statement:

ANL is a leader in HPC, applied math, and computational science, making significant contributions to the vision, planning and coordination of these efforts and changing the thinking or direction of the international community in areas such as programming models for HPC, distributed computing, parallelization tools, optimization and simulations in materials, nuclear physics, nuclear energy, and climate. Development of the Leadership Computing Facility (LCF) has encountered obstacles - both technical and organizational. ANL has worked hard in FY08 to overcome those obstacles and ASCR is very pleased with the results of those efforts but serious mistakes were made early on that required senior DOE intervention.

Objective 3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision

Score: 3.5 Grade: A- Weighting: 30

Objective 3.1 Performance Summary Statement:

Efficiency and Effectiveness of joint planning (e.g., workshops) with outside community

- ANL has done an excellent job in FY08 with regard to outreach for INCITE, SciDAC ([redacted]), and distributed computing, and in turning research efforts into integrated tools that advance the goals of other fields and projects.
- ANL have provided leadership and vision to the multi-institutional Cyber security effort.
- ANL had demonstrated leadership in organizing the international computer science research community to address the needs of extreme scale computing.

Articulation of scientific vision

- ANL have made progress in developing and articulating a clear and ambitious scientific vision.

Development of core competencies, ideas for new facilities and research programs

- ANL are strong partners in the IBM/LLNL/ANL research project to develop the Blue Gene architecture and ensure its continued productivity for science applications.

Ability to attract and retain highly qualified staff.

- ANL has exceeded expectations in attracting and retaining highly qualified staff with FY08 standouts [redacted] and [redacted] for the ALCF.

Objective 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management

Score: 3.1 Grade: B+ Weighting: 40

Objective 3.2 Performance Summary Statement:

Quality of R&D and/or user facility strategic plans, adequacy in considering technical risks and success in identifying/avoiding technical problems

- ANL research planning continues to be excellent and to enable successful long-term multi-institutional and multi-disciplinary efforts in high risk areas.
- ANL facility efforts have encountered obstacles - both technical and organizational. But ANL has worked hard in FY08 to overcome those obstacles.

Effectiveness in leveraging (synergy with) other areas of research

- In this area ANL has demonstrated excellence - both in adopting results from other areas and applying them in innovative ways and in transferring results to other areas.

Demonstration of willingness to make tough decisions (i.e., cut programs with sub-critical mass of expertise, divert resources to more promising areas, etc.).

- While the lab has made tough decisions, such as to keep ALCF staffing down to enable faster growth of the resource, this strategy also increases risk.

Objective 3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs

Score: 2.5 Grade: B- Weighting: 30

Objective 3.3 Performance Summary Statement:

Although ANL has made major improvements, ANL problems in this area early in FY08 did not meet program expectations and small problems persist in each of these areas:

The quality, accuracy and timeliness of response to customer requests for information;

- At least one ANL project failed to notify ASCR in a timely fashion about the changed status of a pending award with the potential for overlap with ASCR proposed work.

The extent to which the Contractor keeps the customer informed of both positive and negative events at the Laboratory so that the customer can deal effectively with both internal and external constituencies; and

- ASCR was not fully apprised of the problems with the IBM chips for the ALCF in a timely fashion and there was significant miscommunication with IBM that required senior DOE intervention.

The ease of determining the appropriate contact (who is on-point for what)

- At least one ANL FWP had the wrong program contact and/or contact information, causing confusion and lost time for ASCR program staff.

Office of Science
U.S. DEPARTMENT OF ENERGY

Laboratory Year-End Performance Assessment Report

Date:
11/10/2008

Headquarters Program Office Fiscal Year 2008 Evaluation of UChicago Argonne, LLC for Management and Operation of the Argonne National Laboratory

Agency:
Department of Energy - Office of Science

Program Office:
Office of Basic Energy Sciences

FY Funding Level: (Budget Authority)

Evaluator:
[redacted]

Phone Number:
[redacted]

E-mail Address:
[redacted]

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

Goal Score: 3.40 Goal Grade: B+

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 1.0 Performance Summary Statement:

The materials sciences research programs have demonstrated sustained leadership and significant impact in x-ray and neutron scattering science and instrumentation, magnetic and superconducting materials. Chemical sciences research programs in atomic, molecular, and optical sciences, heavy element chemistry, separations, chemical dynamics, and photochemistry continued to demonstrate sustained scientific progress and impact.

Objective 1.1 Science and Technology Results Provide Meaningful Impact on the Field

Score: 3.2 Grade: B+ Weighting: 50

Objective 1,1 Performance Summary Statement:

The Condensed Matter Physics and Materials Chemistry activities supported by the Materials Sciences and Engineering (MSE) Division were reviewed in FY 2008. The review found the program to be of high scientific quality. ANL maintained a program that is synergistic, multidisciplinary and served to address DOE mission-relevant science areas. In particular, ANL was recognized as a world leader in several areas of materials science, including magnetic materials, superconductors, complex oxides, and advanced characterization. The output of the staff in terms of the quantity and quality of scientific papers in peer-reviewed journals was impressive. Researchers had valued collaborations within ANL and active participation and leadership within national and international scientific communities. During the previous review, ANL was asked to strengthen its ties to universities. Since then, the laboratory hired several joint lab-university scientists as well as a significant number of high-quality post-doctoral and graduate students. However, the Field Work Proposals (FWPs) of Materials Theory Institute, Nanostructured Carbons, and Biocomposite Materials had issues which required action items that included submission of a revised management plan, a focused research plan, and a research/ staffing transition plan, respectively. Another FWP, Molecular Materials, was phased out due to its continued lack of focus and a clear BES-centric vision.

The Chemical Dynamics program, supported by the BES Chemical Sciences, Geosciences, and Biosciences (CSGB) Division within the Gas-Phase Chemical Physics activity, was reviewed onsite in November 2007. On the whole, the activity received outstanding reviews, with results demonstrating scientific quality, impact, and relevance to the DOE mission. The effort employed unique capabilities and took good advantage of the national laboratory setting. The strongly coupled theory and experimental efforts were a core element of this program's approach, lending it unique scope and quality, as did the degree of innovation and collaboration displayed across the program. The program was notably strengthened by an excellent hire in theoretical chemistry who contributed significantly to the current success of the program and its future prospects.

Ongoing CSGB Division programs in Atomic, Molecular, and Optical (AMO) Physics, Separations Science, Heavy Element Chemistry, Catalysis Science, and Photochemistry were not reviewed in FY 2008, but were generally quite strong, contained several world-class investigators, and continued to make excellent progress. The AMO Physics program was noted for its extensive collaborations with other research programs within the CSGP AMO Sciences program.

Objective 1.2 Provide Quality Leadership in Science and Technology

Score: 3.3 Grade: B+ Weighting: 20

Objective 1.2 Performance Summary Statement:

Research projects supported at ANL by the BES MSE Division were deemed to be world-leading according to the most recent review. The synergy of the theory and synthesis efforts, coupled with the laboratory's x-ray and neutron scattering expertise in instrumentation and technique development, ensured the program's prominence in important energy-relevant areas in condensed matter physics. A state-of-the-art oxide molecular-beam epitaxy (MBE) system was constructed which is capable of the precise layer-by-layer deposition of new materials. The strong interaction among synthesis, characterization and theory will likely produce new and exciting results. The superconductivity research group was very strong, with the principal investigators recognized as among the leaders in the field. The combination of synthesis, characterization, theory and computation made this activity particularly strong.

The Chemical Dynamics program reviewed in FY 2008 was generally outstanding in its scientific merit, innovation, productivity, and impact on the field of combustion-relevant chemical physics. The laboratory staff included world–renowned scientists noted for innovations in the field. The AMO Physics program was not reviewed in FY 2008, but continued to made strong contributions to planning for science next-generation light sources, particularly regarding ultrafast science at specialized beamlines at the Advanced Photon Source (APS), Advanced Light Source (ALS), and the Linac Coherent Light Source (LCLS). CSGB Division programs in Heavy Element Chemistry, Separation Science, Catalysis Science, and Photochemistry not reviewed in FY 2008 also have nationally and internationally recognized investigators.

Objective 1.3 Provide and Sustain Outputs that Advance Program Objectives and Goals

Score: 3.8 Grade: A Weighting: 15

Objective 1.3 Performance Summary Statement:

The activities supported by the MSE Division continued to produce a large number of high-quality peer reviewed journal articles. The program frequently reported research accomplishments and high-impact publications in prestigious journals in areas of high temperature superconductivity, magnetism, and complex materials.

Overall, the quantity and quality of research outputs in peer-reviewed journals for the programs of the CSGB Division were fully acceptable. The Chemical Dynamics program reviewed in FY 2008 produced 114 publications in peer-reviewed journals during the previous 3-year funding cycle, an excellent record of productivity and quality.

Objective 1.4 Provide for Effective Delivery of Products

Score: 3.8 Grade: A Weighting: 15

Objective 1.4 Performance Summary Statement:

The activities supported by the MSE Division were effective in transmitting the results to the community. ANL management for the materials research program was very responsive to BES requests.

CSGB Division research programs were effective and efficient in meeting scientific objectives and milestones, as measured by peer review. The programs were responsive to requests from BES for information and research highlights.

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operation of Research Facilities

Goal Score: 3.32 Goal Grade: B+

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 2.0 Performance Summary Statement:

While the Advanced Phone Source continues to be a leading national facility with a large number of users and publications, its management has not demonstrated visionary leadership in strategic planning

and in effective management of its Short Pulse X-ray Source Project. The Center for Nanoscale Materials (CNM) has operated a robust user program with outstanding scientific output.

Objective 2.1 Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)

Score: 3.2 Grade: B+ Weighting: 10

Objective 2.1 Performance Summary Statement:

APS management was in the early stages of defining a strategic plan, including a design of the facility's upgrade. APS management has been interacting with the community to define the best technical approach for the upgrade.

Objective 2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components (execution phase, Post CD-2 to CD-4)

Score: 3.7 Grade: A- Weighting: 25

Objective 2.2 Performance Summary Statement:

In FY 2008, ANL Electron Microscopy Center staff participated in the DOE TEAM project by taking an active role working with CEOS, as a subcontractor to ANL, to build and assess the viability of unique state-of-the-art chromatic aberration correctors. This highly specialized technical work in electron optics progressed well in FY 2008, leading to substantial progress in these correctors. Much of this work was done at CEOS facilities in Europe, necessitating some significant travel abroad. Also accomplished in FY 2008 were preparations for a postdoc position in electron optics and preparations to bring a test column to ANL to support further corrector testing there. ANL also performed well in FY 2008 in magnet and girder assembly integration efforts in support of the LCLS project.

Objective 2.3 Provide Efficient and Effective Operation of Facilities

Score: 3.0 Grade: B Weighting: 45

Objective 2.3 Performance Summary Statement:

The APS operated with very high reliability (97.6%) for 4503 hours in FY 2008. It had a total of 3279 unique users, of which 50 were remote users. A BES Scientific User Facility Division triennial operations review was held December 10-13, 2007. There was increased user support on the CAT beamlines that have transitioned to facility beamlines. The web-based proposal system and evaluation process were excellent. However, APS had some serious shortcomings in the scientific and technical leadership in both the Accelerator Systems Division and the X-ray Science Divisions. There was a top-down management style with no transparent process for setting priorities in consultation with users, staff, and advisory committees (UEC and SAC).

The Intense Pulsed Neutron Source ceased to operate in January 2008 due to a major BES budget shortfall. It started the process of transitioning to decommissioning of the facility. During the first quarter of FY 2008 there were 89 unique users.

Both the Center for Nanoscale Materials (CNM) and the Electron Microscopy Center (EMC) user facilities operated efficiently and effectively with minimal downtime. Operating time and capabilities

were constrained primarily by budget limitations and by equipment maintenance and repair needs.

Objective 2.4 Utilization of Facilities to Grow and Support Lab's Research Base and External User Community

Score: 3.6 Grade: A- Weighting: 20

Objective 2.4 Performance Summary Statement:

The APS was a key facility for ANL scientists in biology, chemistry, and the material sciences. The ANL CNM nanoprobe beamline is located on the APS Storage Ring, and CNM staff and users employed this and other beamlines for characterization of nanomaterials.

The CNM continued to carry out and facilitate a strong scientific program, as reflected by several recognitions for work done within the facility. The number of users in FY 2008 increased very substantially over that in FY 2007, and CNM staff was also involved in planning and organizing user meetings and other workshops of substantial interest to the broad scientific community.

The Electron Microscopy Center (EMC) continued to provide capabilities that were used widely within the laboratory for its research programs. A modest decrease in the number of users in FY 2008 versus FY 2007 was in line with historical user numbers for the prior several years and consistent with approximately flat funding over this period.

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Goal Score: 3.33 Goal Grade: B+

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 3.0 Performance Summary Statement:

The Materials Science Division has demonstrated effective program management and leadership in developing compelling program visions through effective strategic planning. Program management within the newly formed ANL Chemical and Engineering Sciences Division is still in transition, and needs a clearly defined strategic plan that is well aligned with objectives of the laboratory and of the BES program. The interim Chemistry Division leadership was effective and responsive to BES mission needs. The Advanced Photon Source had serious shortcomings in the scientific and technical leadership in both the Accelerator Systems Division and the X-ray Science Divisions.

Objective 3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision

Score: 3.0 Grade: B Weighting: 40

Objective 3.1 Performance Summary Statement:

Research activities supported by the MSE Division in the topical areas of magnetic materials, superconductors, complex oxides, and advanced characterization were recognized as scientific leaders. These projects were a central part of ANL's core competencies. The FY 2008 review of the program found the majority of efforts to be synergistic, multidisciplinary, and addressing DOE mission-relevant science areas.

The ANL coordinator of the programs supported by the MSE Division was effective with frequent communications along properly defined management lines. The coordinator played a major role in organizing and participating in several BES Basic Research Needs Workshops. This year, the coordinator took a leadership role in the BESAC New Era Sub-committee which was charged with organizing a Photon Sciences Workshop to supply BESAC with recommendations for future light source needs to achieve the research goals outlined in the Basic Research Needs workshops.

In FY 2008, the ANL Chemistry Division was merged with the Chemical Technology Division to form the Chemical and Engineering Sciences (CSE) Division. The stated strategic motivation for this merger was to enhance synergy and integration between CSGB Division supported programs and those supported by DOE technology offices, particularly in the areas of catalysis and heavy element/nuclear chemistry. Improved integration between basic and applied research was an important and timely subject, but it remained unclear that a whole scale merger of two rather disparate organizations will affect significant improvement in this area. The CSGB Division is also concerned that this merger could damage the scientific quality of its basic research programs at ANL. A complete understanding of the advantages or consequences of the new CSE Division structure awaits the leadership of the new division director (hired at the start of FY 2009) and subsequent CSGB program reviews, particularly those in the areas thought to benefit most from the new organization – catalysis and heavy element chemistry.

The interim CSE Director continued the clear strategic vision for the ANL Chemical Dynamics and AMO Physics groups. These groups developed beneficial strategic relationships with external organizations, and they were effectively focusing efforts on BES mission goals. The recent hiring of a very talented, mid-career scientist into the Chemical Dynamics program benefitted that program significantly.

Also, mentioned before, the APS had some serious shortcomings in the scientific and technical leadership in both the Accelerator Systems Division and the X-ray Science Divisions. There was a top-down management style with no transparent process for setting priorities in consultation with users, staff, and advisory committees (UEC and SAC).

Objective 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management

Score: 3.3 Grade: B+ Weighting: 30

Objective 3.2 Performance Summary Statement:

The programs supported under Condensed Matter Physics and Materials Chemistry exhibited excellent planning and management, with the laboratory coordinator strategically investing in high performing areas. The laboratory's strategic planning exercise resulted in several new projects. In FY 2008, the laboratory began a new project in Quantum Mesocsopic Materials and Structures which will enhance the Theoretical Condensed Matter Physics activities.

Management of the ANL Chemical and Engineering Sciences Division put forth a clear and logical plan to the CSGB Division in which the bulk of the funding from the terminated Radiation Chemistry program should be reinvested in the ANL AMO Physics and Chemical Dynamics programs that have demonstrated excellence in peer review. The successful review of the Chemical Dynamics program in FY 2008, which follows an equally successful review of the AMO Physics program in FY 2007, fully validated that plan.

Objective 3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs

Score: 3.8 Grade: A Weighting: 30

Objective 3.3 Performance Summary Statement:

Management of the programs supported by the MSE Division was effective with frequent communications along properly defined management lines. The laboratory continued to do an outstanding job in community outreach activities associated with the Basic Research Needs Workshops.

Communications between the CSGB Division and the interim management of the ANL Chemical and Engineering Sciences Division was generally thorough and timely in FY 2008.

Office of Science
U.S. DEPARTMENT OF ENERGY

Laboratory Year-End Performance Assessment Report

Date:
11/3/2008

Headquarters Program Office Fiscal Year 2008 Evaluation of UChicago Argonne, LLC for Management and Operation of the Argonne National Laboratory

Agency:
Department of Energy - Office of Science

Program Office:
Office of Biological and Environmental Research

FY Funding Level: (Budget Authority)

Evaluator:
[redacted]

Phone Number:
[redacted]

E-mail Address:
[redacted]

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

Goal Score: 3.04 Goal Grade: B

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 1.0 Performance Summary Statement:

The Structural Biology Center (SBC) at the Advanced Photon Source (APS) continues to provide world leadership in the field of protein structure determination.

ANL's synchrotron-based methods continue to provide cutting edge analyses for environmental studies within the Environmental Remediation Sciences Program (ERSP).

ANL has tremendous unrealized potential with its limited research program that is excellent and in some cases, e.g., structural biology, world class. However, overall, the very limited amount of research in environmental remediation sciences, climate change, and life sciences other than

structural biology is a concern and a challenge for the lab to continue their development efforts.

Objective 1.1 Science and Technology Results Provide Meaningful Impact on the Field

Score: 3.1 Grade: B+ Weighting: 30

Objective 1,1 Performance Summary Statement:

The Structural Biology Center (SBC) at the Advanced Photon Source (APS) continues to provide world leadership in the field of protein structure determination. Experiments at its insertion device (ID) beamline resulted in more new structures of proteins and protein complexes being deposited in the Protein Data Bank than any other beamline in the world, by a margin of more than 30% over the second-best beamline. The structures were in many cases the subject of research articles in top-tier journals such as *Science* and *Nature*. ANL's synchrotron-based methods continue to provide cutting edge analyses for environmental studies within the Environmental Remediation Sciences Program (ERSP). In climate change research, ANL is successfully developing a new modeling approach, a scalable and extensible earth system model.

Objective 1.2 Provide Quality Leadership in Science and Technology

Score: 3.1 Grade: B+ Weighting: 20

Objective 1.2 Performance Summary Statement:

The SBC is a leader in implementing new technology, in providing outstanding structural information and in attracting the most prominent researchers in biophysics as collaborators. The director of the SBC is acknowledged world-wide as one of the leaders in this field and is in high demand to speak about the SBC vision and accomplishments at major scientific meetings. In Climate Change Research, Argonne is leading the development of an Earth System Model for testing new aerosol parameterizations. ANL continues to be a leader in adapting synchrotron-based methods at the APS to environmental studies as evidenced by numerous productive collaborations that have developed.

Objective 1.3 Provide and Sustain Outputs that Advance Program Objectives and Goals

Score: 2.8 Grade: B Weighting: 20

Objective 1.3 Performance Summary Statement:

The SBC provides outstanding quantity and quality of structures of proteins and protein complexes. Its ID beamline is the most productive in the world, and the more than 70 peer-reviewed scientific publications in FY 2008 from the SBC and its users is well above that of most other such programs world-wide. The staff of the SBC has been highly responsive to the recommendations of the most recent merit review, held in 2006. The research projects in Genomics: GTL also are highly productive. ANL continues to publish impactful science manuscripts employing synchrotron techniques in high quality peer reviewed journals such as *Environmental Science & Technology, Public Library of Science,* and others.

Overall, the unrealized potential of ANL's program limits its ability to contribute broadly to BER program goals. A multipurpose laboratory like ANL should be making significant contributions to many different areas across the breadth of the BER program.

Objective 1.4 Provide for Effective Delivery of Products

Score: 3.1 Grade: B+ Weighting: 30

Objective 1.4 Performance Summary Statement:

The SBC provides outstanding quantity and quality of structures of proteins and protein complexes. Its ID beamline is the most productive in the world, and the more than 70 peer-reviewed scientific publications in FY 2008 from the SBC and its users is well above that of most other such programs world-wide. The staff of the SBC has been highly responsive to the recommendations of the most recent merit review, held in 2006. The research projects in Genomics: GTL also are highly productive. ANL continues to publish impactful science manuscripts employing synchrotron techniques in high quality peer reviewed journals such as *Environmental Science & Technology, Public Library of Science,* and others. ANL continues to work with ERSP investigators on project of mutual interest requiring the synchrotron capabilities of the APS.

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operation of Research Facilities

Goal Score: 3.71 Goal Grade: A-

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 2.0 Performance Summary Statement:

ANL's Structural Biology Center (SBC) at the APS leads the world in its efficient use of its beamline.

The Atmospheric Radiation Measurement (ARM) Climate Research Facility (ACRF) exceeded its operational metrics for each quarter in FY 2008 and its Environmental Safety and Health record was exceptional.

ANL's SBC and ACRF are leading facilities for the conduct of biological and climate change research, attracting leading scientists and resulting in high profile, impactful publication. However, ANL has done relatively little to use either the SBC or the ACRF to grow its internal climate or biology research programs.

Objective 2.1 Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)

Score: NA Grade: NA Weighting: 0

Objective 2.1 Performance Summary Statement:

Objective 2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components (execution phase, Post CD-2 to CD-4)

Score: NA Grade: NA Weighting: 0

Objective 2.2 Performance Summary Statement:

Objective 2.3 Provide Efficient and Effective Operation of Facilities

Score: 3.8 Grade: A Weighting: 90

Objective 2.3 Performance Summary Statement:

The Atmospheric Radiation Measurement (ARM) Climate Research Facility (ACRF) was very productive in 2008. Using procedures to ensure that instruments are operating within specifications, ACRF exceeded its operating metrics for each quarter for FY 2008. The ACRF met with several user groups, including international workshops, and has initiated an activity to provide measurements of a critical parameter for climate models, vertical velocity. The Environmental Safety and Health record is exceptional; there were no lost-time work days, no days with a recordable accident, no days with property damage incidents, and no days with a reportable loss to vehicles for FY 2008. The ACRF has been active outreach; thus, the number of users has significantly exceeded DOE expectations for FY 2008. ANL has successfully recruited personnel to cover key facility activities.

The SBC leads the world in the efficiency of use of its ID beamline, producing 285 depositions in the PDB in FY 2008, almost 100 more than its nearest competitor worldwide. The bending magnet beamline is also used effectively, despite its poorer brightness, in particular for preliminary experiments to select crystals for use at the ID beamline. This enables maximum use to be made of the ID beamline and is a reason for its extraordinary productivity.

Objective 2.4 Utilization of Facilities to Grow and Support Lab's Research Base and External User Community

Score: 2.9 Grade: B Weighting: 10

Objective 2.4 Performance Summary Statement:

In FY 2008, ACRF users produced significant science, and have made improvements to several climate models. For example, a study using five years of data that demonstrated a strong diurnal evolution of clouds. These results are being used to evaluate model simulations of clouds. The Community Climate System Model is one of these impacted models, and the new representation of aerosols will improve the simulations for the next IPCC assessment. Users have also improved the accuracy of weather forecast models. The ACRF is a recognized leader for climate observations, as evidenced by the invitation of the ANL ACRF manager to participate in an international steering committee tasked with building an international climate observing network. This group has acknowledged ACRF as the standard for surface-based observations. A concern is that the Laboratory has done relatively little to use the ACRF to grow its internal climate research programs.

The SBC attracts a large number of collaborators and is a major contributor to the Laboratory's external user community. This record is outstanding. The leadership role of SBC staff in the Midwest Center for Structural Genomics, a large National Institutes of Health program project at the Laboratory, is also evidence for the ability of the Laboratory to use the APS to grow its research base. A concern is that the Laboratory has done relatively little to use the APS to grow its other biological research programs in

areas relevant to the DOE missions in energy and environment.

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Goal Score: 3.04 Goal Grade: B

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 3.0 Performance Summary Statement:

ANL exhibits outstanding management of programs related to or associated with the SBC and ACRF, including doing an excellent job of proactively communicating with BER program managers.

ANL has been relatively ineffective in efforts to expand its environmental, climate, and non-SBC focused biology programs.

Objective 3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision

Score: 2.7 Grade: B- Weighting: 20

Objective 3.1 Performance Summary Statement:

The Laboratory provides outstanding stewardship of and vision for its capabilities in structural biology, including the retention of outstanding scientists such as those in the SBC, but has demonstrated only moderate programmatic vision in the biological sciences outside that area. It has made only modest connections with outside scientists in areas such as bioenergy and biological research for environmental applications. In FY2008 ANL demonstrated its scientific vision through the development of the ANL science plan for environmental remediation. ANL has incorporated external collaborations into its ERSP program and is in the early stages of seeking to broaden its expertise to take advantage of emerging capabilities (metagenomics). The ACRF Operations Manager is an invited active member of a World Meteorological Organization steering committee tasked with building an international climate observing network.

Objective 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management

Score: 2.5 Grade: B- Weighting: 30

Objective 3.2 Performance Summary Statement:

The research plans of the SBC are well thought out, proactive, and endorsed by external experts. Contingency plans exist for potential problems, for example the failure of one of the two detectors in FY 2008 was solved by a short-term measure until the replacement was received. Planning of biological research outside of structural biology is adequate but not as yet strategic. ANL is working effectively with BER staff to improve its ERSP science plan. A key staff member will need to be replaced under ANL's new ERSP program. The ACRF is operating under a strategic plan that was highly rated by a 2007 review panel that emphasized the cost-effective support of the scientific community. New planning is underway to address changing DOE priorities. ANL has been relatively ineffective in efforts to expand its environmental, climate, and non-SBC focused biology programs.

Objective 3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs

Score: 3.5 Grade: A- Weighting: 50

Objective 3.3 Performance Summary Statement:

Laboratory management is effective in providing information for BER Program Office staff on developments and opportunities in the biological sciences. The scientists directing programs such as the SBC provide frequent and valuable updates on progress and accomplishments. The ACRF Operations Manager provides highly informative monthly reports of the facility operations. The manager also contacts in a timely manner DOE concerning any critical issues and proposes a solution to the problem. He addressed the logistical and political issues in dealing with the Chinese government during the current mobile facility deployment with diplomacy and technically sound solutions.

Office of Science
U.S. DEPARTMENT OF ENERGY

Laboratory Year-End Performance Assessment Report

Date:

Headquarters Program Office Fiscal Year 2008 Evaluation of UChicago Argonne, LLC for Management and Operation of the Argonne National Laboratory

Agency:
Department of Energy - Office of Science

Program Office:
Office of High Energy Physics

FY Funding Level: (Budget Authority)
11,959,000

Evaluator:
[redacted]

Phone Number:
[redacted]

E-mail Address:
[redacted]

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

Goal Score: 3.46 Goal Grade: A-

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 1.0 Performance Summary Statement:

- Detector development and accelerator science are two strengths of the ANL high energy physics.
-

Objective 1.1 Science and Technology Results Provide Meaningful Impact on the Field

Score: 3.5 Grade: A- Weighting: 30

Objective 1,1 Performance Summary Statement:

The Argonne High Energy Physics program features hadron collider physics using ATLAS and CDF, neutrino physics using MINOS and NOvA, particle physics theory, and particle astrophysics with VERITAS and DES. ANL also performs research in accelerator science and R&D on superconducting RF.

The Argonne Wakefield Accelerator (AWA) group has shown that dielectric structures can sustain accelerating gradients over 100MV/m, which is almost five times the gradient typically used in accelerators today.

Objective 1.2 Provide Quality Leadership in Science and Technology

Score: 3.5 Grade: A- Weighting: 30

Objective 1.2 Performance Summary Statement:

[redacted] was selected to by deputy physics coordinator for the ATLAS Collaboration at the LHC, which has approximately 2100 physicists from 35 countries. He will succeed the current physics coordinator after one year. [redacted] led the commissioning ATLAS hadronic calorimeter.

Argonne guided the membership of Northern Illinois University in the ATLAS Collaboration. The NIU group worked ATLAS for several years as an affiliate member sponsored by ANL.

Objective 1.3 Provide and Sustain Outputs that Advance Program Objectives and Goals

Score: 3.4 Grade: B+ Weighting: 30

Objective 1.3 Performance Summary Statement:

Together with [redacted] and Material Science Division we are developing new large area photo sensors (aimed at DUSEL large Cerenkov) and with ppico-second timing resolution.

The AWA group is commissioning of a new klystron is about to finish. This will enable a second beamline for conducting the two-beam acceleration research.

Objective 1.4 Provide for Effective Delivery of Products

Score: 3.4 Grade: B+ Weighting: 10

Objective 1.4 Performance Summary Statement:

Detector development is one of the strengths of the Argonne high energy physics group. This year the first vertical slice of a digital hadron gas calorimeter with 4000 channels was built, operated and analyzed. Based on these results the construction of a 400K channel calorimeter is in progress.

The ANL/FNAL SRF cavity processing facility is now operational at ANL. The results this year

- 5 electropolish procedures for ILC performed
- 3 cavities cold tested
- Reached 33 MV/m after EP with recent single cell

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operation of Research Facilities

Goal Score: 3.40 Goal Grade: B+

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 2.0 Performance Summary Statement:

- ANL is delivering on their commitments to the ATLAS, NOvA, and DES projects.

Objective 2.1 Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)

Score: 3.4 Grade: B+ Weighting: 50

Objective 2.1 Performance Summary Statement:

ANL participates in two HEP projects, the Dark Energy Survey (DES) Project and the NOvA Project. DES received CD-2 in April 2008 and NOvA in September 2008. ANL has played an important role in the engineering of the detector structure for NOvA, unfortunately progress was almost completely stopped by the reduction of funding for NOvA in the FY 2008 Omnibus.

Objective 2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components (execution phase, Post CD-2 to CD-4)

Score: 3.4 Grade: B+ Weighting: 50

Objective 2.2 Performance Summary Statement:

DES successfully reached CD-3A in FY 2008 and CD-3B just after the fiscal year ended. This was ahead of schedule. The ANL contributions are in the area of mechanical engineering of the optical system and some work on the instrument control software. All contributions were all satisfactory.

The major fabrication effort (post CD-2) at ANL for the ATLAS project has been completed. ANL has met all of their milestones on time and on budget.

Objective 2.3 Provide Efficient and Effective Operation of Facilities

Score: NA Grade: NA Weighting: 0

Objective 2.3 Performance Summary Statement:

Objective 2.4 Utilization of Facilities to Grow and Support Lab's Research Base and External

User Community

Score: NA Grade: NA Weighting: 0

Objective 2.4 Performance Summary Statement:

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Goal Score: 3.54 Goal Grade: A-

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 3.0 Performance Summary Statement:

- The HEP Division dealt effectively to mitigate the impact of the reduced funding due to the FY 2008 Omnibus Appropriation.
- The Director of the High Energy Physics Division has reached out to other parts of Argonne to find expertise to support the high energy physics mission.

Objective 3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision

Score: 3.5 Grade: A- Weighting: 40

Objective 3.1 Performance Summary Statement:

The Director of the High Energy Physics Division has reached out to other parts of Argonne to find expertise to support the high energy physics mission. He has developed collaborations with nuclear physics and materials science to support superconducting RF R&D. The lab is developing a labwide astrophysics initiative, which the High Energy Physics Division is participating.

Objective 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management

Score: 3.6 Grade: A- Weighting: 40

Objective 3.2 Performance Summary Statement:

The planning of the High Energy Physics Division has improved in the recent years and the Division dealt effectively to mitigate the impact of the reduced funding due to the FY 2008 Omnibus Appropriation. The Division Director has been proactive in setting up collaborations within the laboratory to address high energy physics needs. He has articulated a realistic ANL program aligned with high energy physics priorities.

Objective 3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs

Score: 3.5 Grade: A- Weighting: 20

Objective 3.3 Performance Summary Statement:

Communications with OHEP are good. The lab is responsive to requests for information and the responses are generally of good quality.

Office of Science
U.S. DEPARTMENT OF ENERGY

Laboratory Year-End Performance Assessment Report

Date: 11/18/2008

Headquarters Program Office Fiscal Year 2008 Evaluation of UChicago Argonne, LLC for Management and Operation of the Argonne National Laboratory

Agency:
Department of Energy - Office of Science

Program Office:
Office of Nuclear Physics JOY

FY Funding Level: (Budget Authority)
26,121,000

Evaluator:
[redacted]

Phone Number:

E-mail Address:
[redacted]

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

Goal Score: 3.90 Goal Grade: A

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 1.0 Performance Summary Statement:

The ANL nuclear physics group performs at a high level in all areas in mission accomplishment and merits a grade of A:

- Conducted high-precision mass measurements of several nuclei in the A~90 region that ruled out the vp-process as the origin of the anomaly in the relative production abundances of ^{92,94}Mo.
- Provided new tests of *ab initio* theoretical calculations of light nuclei through measurements of charge radii of ^{6,8}He, studies of unbound states in ^{7}He, and precision lifetime measurements of ^{10}Be.

- Further elucidated the existence of a new subshell gap at neutron number N=32.
- Published approximately 150 research papers in peer-reviewed journals.
- Delivery of 5670 hours of accelerated beams (exceeded plans) to serve approximately 370 users.
- Sustained progress towards energy upgrade of Argonne Tandem Linac Accelerator System (ATLAS), and construction of the Californium Rare Ion Breeder Upgrade (CARIBU), which will deliver accelerated beams of rare fission fragments.
- Continued R&D effort and pre-conceptual design of the Facility for Rare Isotope Beam (FRIB).

The scores and grades for Goal 1-3 are based on the written material provided in lieu of the annual ATLAS S&T review, communication to NP at the February Laboratory Managers' Briefings, Project Reviews (peer review), quarterly reports by project contract managers, biweekly conference calls with Physics Division management, NP program manager's observations at national meetings, and NP program manager's judgment.

Objective 1.1 Science and Technology Results Provide Meaningful Impact on the Field

Score: 4.0 Grade: A Weighting: 35

Objective 1,1 Performance Summary Statement:

The ANL Physics Department low energy subprogram scientists conduct high priority research at the Argonne Tandem Linac Accelerator System (ATLAS) in nuclear structure, reaction, astrophysics, and fundamental interactions to address goals of the national program. The ANL program is essential to accomplish many of the milestones in these areas, including nuclear structure near closed shells, exploration of the proton dripline, reactions important to the stellar production of radionuclides, and data necessary to test the unitarity of the quark mixing matrix. These studies are performed using stable and radioactive ion beams that are produced in either batch mode or in flight.

The ANL scientists operate several powerful state-of-the-art detector systems for their users: (a) Gammasphere (the world's most powerful high-resolution gamma detection system) for studies of nuclei at high spins, K-isomers in very heavy nuclei, exotic shapes and novel symmetries, and transactinide nuclei; (b) the Fragment Mass Analyzer (FMA) to probe nuclear structure and properties at or near proton dripline; and (c) the Canadian Penning Trap for precision mass measurements.

The ANL scientists have performed high-precision mass measurements of several nuclei in the A~90 region that ruled out the νp-process as the origin of the anomaly in the relative production abundances of ^{92,94}Mo.

The ANL scientists performed several experiments to test *ab initio* calculations of light nuclei, and refine development of two- and three-body realistic interactions. They included measurements of charge radii of ^{6,8}He, studies of unbound states in ^{7}He, and precision lifetime measurements of ^{10}Be.

The ANL scientists performed spectroscopic studies of several nuclei around ^{54}Ti to further elucidate the existence of a new subshell gap at neutron number N=32.

The ANL group has developed the concept and fabricated a new type of magnetic spectrometer

(HELIOS) that will advance spectroscopic studies of rare isotopes via transfer reactions in reverse kinematics. This device is being commissioned for use in FY 2009.

The ANL scientists and technical staff continued their progress toward energy upgrade of the Argonne Tandem Linac Accelerator System (ATLAS), and construction of the Californium Rare Ion Breeder Upgrade (CARIBU), which will deliver accelerated beams of rare fission fragments.

ANL continues to refine the science case for FRIB, and promote a vision that provides a high level of research opportunities for a new scaled-down facility. They drive the technical design for the FRIB.

RIB R&D scientists and engineers at ANL conduct high priority R&D work essential for realization of next generation facility for rare isotope beams (FRIB) to be constructed in the US. ANL researches have made advances in two major areas: (a) a novel gas catcher with rf (radiofrequency) carpet achieving high efficiencies needed for FRIB, and (b) development of triple-spoke SRF accelerating cavities with high field gradients and efficiencies for the driver linac of proposed FRIB. Other R&D work at ANL for FRIB includes liquid metal stripping target and high power beam dump targets with noticeable advances.

The Medium Energy (ME) group at ANL continues to be very productive and effective in their research programs at TJNAF. They recently published results on their precision measurement of ^{8}He using the laser atom trapping technology they developed. The leader of the laser trapping research program, [redacted], received the Francis M. Pipkin Award this year. The group includes several PECASE award winners and a recipient of the Tom W. Bonner Prize in Nuclear Physics. Several members of this group play leadership roles in developing the future Medium Energy program for the TJNAF 12 GeV CEBAF Upgrade and a possible future Electron Ion Collider.

ANL nuclear theorists have made important contributions to several areas of great relevance to the nuclear physics research program, including the modeling of the nuclear force and it's incorporation in studies of the nuclear structure of light nuclei; the derivation of nuclear reaction rates of relevance to astrophysics; unusual properties of nuclei in extreme situations (high spin and near the neutron drip line); and the spectroscopy of mesons and excitations of the nucleon.

Objective 1.2 Provide Quality Leadership in Science and Technology

Score: 3.9 Grade: A Weighting: 25

Objective 1.2 Performance Summary Statement:

The ANL Low energy (LE) group is among the world leaders in the exploration of properties of weakly-bound nuclei near proton dripline, use of unstable nuclei to study reactions of interest to nuclear astrophysics, and mass measurements with high precision.

The ANL group members have been leaders for more than a decade to develop the science case and technical concept for the facility for rare isotope beams (FRIB). They have provided highly effective input to the National Academies study of the need for a world-leading U.S. FRIB facility, and to the NSAC taskforce for FRIB. The University of Chicago/Argonne LLC mad an application in response to the Funding Opportunity Announcement for FRIB.

A number of the ANL researchers are recognized as leaders in their respective areas, in addition to being recognized internationally as experts in the field. Several group members serve on national international review panels.

ANL scientists are leaders in the development of superconducting radiofrequency accelerating cavities for heavy ion applications, including new types of cavities installed in ATLAS, new designs for FRIB, and R&D for other future accelerators.

Objective 1.3 Provide and Sustain Outputs that Advance Program Objectives and Goals

Score: 3.8 Grade: A Weighting: 25

Objective 1.3 Performance Summary Statement:

In FY 2008, ANL scientists authored or co-authored 151 articles in refereed journals, and presented 112 invited talks. Ten Ph.D. theses were completed based on research at ATLAS. The journal articles included 63 in nuclear structure and nuclear astrophysics, 32 in nuclear theory, 12 in accelerator physics, and 37 in medium energy physics.

The ANL LE group has driven the intellectual processes to promote the facility for rare isotope beams.

In 2008, two of the postdoctoral associates in Physics received named Fellowships. ANL scientist, [redacted] was recipient of the 2009 Pipkin Award of the American Physical Society. His citation reads:
"For development of techniques to laser cool and trap rare and radioactive atomic species; and for applications of these techniques ranging from trace isotope analysis to tests of fundamental symmetries"

Their technical advances in RIB R&D combined with other key advances at other institutions have provided a rare opportunity for the RIB community toward realization of FRIB.

The RIB R&D group publishes in leading technical journals, makes invited and contributed presentations at national and international meetings, and has played a prominent role in the intellectual processes to promote the facility for rare isotope beams. The group provided important input and presentations for the 2007 NSAC Task Force in RIB.

Objective 1.4 Provide for Effective Delivery of Products

Score: 3.8 Grade: A Weighting: 15

Objective 1.4 Performance Summary Statement:

The ANL Physics Division's Field Work Proposal is comprehensive, with a reasonable financial and workforce plan.

The LE research is well aligned with NP goals in nuclear structure, nuclear astrophysics, and fundamental interactions, and essential to accomplishing approximately 10 of the program milestones over the period 2007-2012.

The group has effectively operated instrumentation for research by users, and served as mentors to a community of 370 users, including a sizeable international community.

The RIB R&D activity is well aligned with the activities of NP goals in Low Energy area by making advances aimed at a timely and affordable realization of FRIB.

The ANL CARIBU project is on cost and schedule.

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operation of Research Facilities

Goal Score: 3.70 Goal Grade: A-

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 2.0 Performance Summary Statement:

The ANL nuclear physics group performs at a high level in all areas in mission accomplishment and merits a grade of A-:

- Delivery of 5670 hours of stable and radioactive ion beams for 47 experiments.
- Sustained progress toward energy upgrade of ATLAS, and construction of CARIBU, and is on track for timely completion.
- The ATLAS staff effectively exploits the synergy between the radioactive ion beam R&D with the improvement of ATLAS and its experimental systems.

Objective 2.1 Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)

Score: NA Grade: NA Weighting: 0

Objective 2.1 Performance Summary Statement:

Objective 2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components (execution phase, Post CD-2 to CD-4)

Score: NA Grade: NA Weighting: 0

Objective 2.2 Performance Summary Statement:

Objective 2.3 Provide Efficient and Effective Operation of Facilities

Score: 3.7 Grade: A- Weighting: 85

Objective 2.3 Performance Summary Statement:

The facility provided 5670 beam hours comprising of both stable and radioactive nuclei, exceeding

plans. The overall reliability of the facility is excellent (~95%) and above requirements.

The ATLAS operations and scientific staff have made excellent progress on the CARIBU project that will provide new re-accelerated neutron-rich beam species to enhance the capabilities of the facility.

The ATLAS energy upgrade project is proceeding well and will result in an increase of ~20% in the energies of heavy ions.

There were no lost work days or ORPS reports. There was one injury reported.

Objective 2.4 Utilization of Facilities to Grow and Support Lab's Research Base and External User Community

Score: 3.7 Grade: A- Weighting: 15

Objective 2.4 Performance Summary Statement:

The ATLAS users program is effective. The experimental program at ATLAS helped in the training of 23 undergraduate students, 27 graduate students, and 22 Postdoctoral associates.

The ANL scientists and researchers organized six topical workshops in FY 2008.

Completion of the ATLAS energy upgrade and CARIBU project will significantly enhance the research capabilities of the facility. The ATLAS/ANL infrastructure is effectively utilized to carry out outstanding enabling R&D for a future US facility for rare isotope beams, for example the fast ion gas catcher, liquid lithium targets and strippers, and accelerator components. Ideas and concepts for rare isotope beam R&D are tested and exploited at ATLAS.

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Goal Score: 3.90 Goal Grade: A

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 3.0 Performance Summary Statement:

The ANL nuclear physics group performs at a high level in all areas in mission accomplishment and merits a grade of A:

- Effective management of the ATLAS facility for research by an international user community.
- Continued a well-coordinated effort to enhance research capabilities at ATLAS, including both accelerator and instrumental systems.
- ANL is one of the key centers for RIB R&D, and one of the two laboratories that submitted a proposal to site the next generation FRIB.
- Responsive actions and communications concerning facility operations and future plans.

Objective 3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program

Vision

Score: 3.9 Grade: A Weighting: 40

Objective 3.1 Performance Summary Statement:

The Physics Division articulates a scientific vision and strategic plan that is devised in consultation with the user community, updated periodically, and serves as a basis for resource planning and justification. The plan identifies development of instruments, nuclear beams, and other resources that are needed to carry out an effective program that is aligned with the national goals.

The ATLAS staff effectively carries out the stewardship of nuclear physics research with both stable and radioactive ion beams to extend the technologies and methodologies necessary for a vital program. The facility serves an international user community.

The ATLAS staff has continued their effort toward energy upgrade of the facility, and completion of the CARIBU project to deliver accelerated beams of fission fragments that are complementary to those available at HRIBF facility at ORNL.

ANL is one of the key centers for RIB R&D providing an effective stewardship of scientific capabilities and program vision. Through this program vision, technical advances have been made that are paving the road toward realization of the next generation FRIB at a lower total cost and in a timely manner.

Objective 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management

Score: 4.0 Grade: A Weighting: 40

Objective 3.2 Performance Summary Statement:

The Physics Division has devised a mid-term, and long-term upgrade pathways for the ATLAS facility.

The CARIBU project to provide new RIBs is ongoing, with effective planning and management.

The Laboratory's long-term goal is to build FRIB, and it has put substantial Laboratory resources into R&D, pre-conceptual planning, and related efforts. The Physics Division and the Laboratory have addressed with internal resources high visibility FRIB technical issues and assisted in reducing technical risk to reasonable levels in many relevant areas. In response to an FOA issued by NP in FY 2008, the Physics Division submitted and participated in the review of a proposal to host the FRIB at ANL.

Objective 3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs

Score: 3.7 Grade: A- Weighting: 20

Objective 3.3 Performance Summary Statement:

The Physics Division responds to requests for information in a timely manner, with information that is reliable. Biweekly teleconferences between the Office of Nuclear Physics and the Physics Division provide a mechanism to communicate issues and concerns routinely.

Appropriate point of contacts are usually known, or provided by the Division management on a timely basis. Reports on the CARIBU project progress are timely and informative.

The RIB R&D group at ANL has participated in several collaborative efforts with groups at other institutions. They have been responsive to program manager for Advanced Technology R&D. They also have been very responsive to inquiries by prospective SBIR companies and in forming collaboration with them in development of new technologies. They have provided opportunities for testing new detectors and instrumentation in collaboration with SBIR companies and other RIB R&D groups.

Office of Science
U.S. DEPARTMENT OF ENERGY

Laboratory Year-End Performance Assessment Report

Date: 1/14/2009

Headquarters Program Office Fiscal Year 2007 Evaluation of UChicago Argonne, LLC for Management and Operation of the Argonne National Laboratory

Agency:
Department of Energy - Office of Science

Program Office:
Office of Workforce Development for Teachers and Scientists

FY Funding Level: (Budget Authority)

Evaluator:
[redacted]

Phone Number:
[redacted]

E-mail Address:

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

Goal Score: 3.13 Goal Grade: B+

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 1.0 Performance Summary Statement:

The science education at Argonne has developed a well-established mentor culture within the laboratory. The success of the undergraduate internship and the DOE ACTS professional development program funded by WDTS is based on the careful attention given to matching dedicated mentors and talented students/educators. Both students and educators are placed in challenging research environments and are carefully guided to a productive outcome. Student products such as research abstracts are not as competitive as other laboratories and need improvement. The education office is committed to providing the encouragement necessary for all participants to successfully complete deliverables but the importance of the research abstract which are published the *Journal of Undergraduate Research* needs to be impressed upon the undergraduates.

ANL ensures that all participants benefit from the extensive enrichment (science seminars, workshops, exposure to opportunities -U. of Chicago- to pursue advanced degrees, etc.) available across the lab.

Objective 1.1 Science and Technology Results Provide Meaningful Impact on the Field

Score: 3.2 Grade: B+ Weighting: 25

Objective 1,1 Performance Summary Statement:

- The science education office is an institution within the laboratory responsible for all the training, HR requirement, ES&H and security training, work-stations, housing, travel, etc. and all are coordinated to the satisfaction of the laboratory divisions and the interns.
- The director of science education office is very attuned to the immediate and long term workforce needs of the laboratory and the DOE programs offices. He has long and valuable experience in managing effective research internship programs and knows how to use the laboratory resources to inspire career considerations at DOE laboratories

Objective 1.2 Provide Quality Leadership in Science and Technology

Score: 3.3 Grade: B+ Weighting: 30

Objective 1.2 Performance Summary Statement:

- Students and educators are carefully matched with mentors where their talents can be developed and they are able to advance their research project and support their mentor.
- Students and educators are placed in challenging research positions that are in the laboratory core mission areas.
- There is a close working connection between the education staff and the research divisions throughout the laboratory. The divisions look to and rely the education to provide talented, conscientious undergraduate inters to assist with many of the fundamental tasks of research projects.

Objective 1.3 Provide and Sustain Outputs that Advance Program Objectives and Goals

Score: 3.2 Grade: B+ Weighting: 30

Objective 1.3 Performance Summary Statement:

- Research interns and educators are paired with researchers who are funded by the Office of Science and are contributing to SC research.
- The accomplishments of interns needs to be better validated by improving quality research abstracts.
- The educators in the DOE ACTS program should collaborative workshop the requirements of the "electronic portfolio" to make more useful to the participants as well as validating the accomplishments of the participants.

Objective 1.4 Provide for Effective Delivery of Products

Score: 2.5 Grade: B- Weighting: 15

Objective 1.4 Performance Summary Statement:

- The large majority of WTDS supported interns/educators report through participant surveys a rewarding, but very challenging given the requires deliverables., laboratory experience.

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operation of Research Facilities

Goal Score: 0.00 Goal Grade: NA

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 2.0 Performance Summary Statement:

Objective 2.1 Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)

Score: NA Grade: NA Weighting: 0

Objective 2.1 Performance Summary Statement:

Objective 2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components (execution phase, Post CD-2 to CD-4)

Score: NA Grade: NA Weighting: 0

Objective 2.2 Performance Summary Statement:

Objective 2.3 Provide Efficient and Effective Operation of Facilities

Score: NA Grade: NA Weighting: 0

Objective 2.3 Performance Summary Statement:

Objective 2.4 Utilization of Facilities to Grow and Support Lab's Research Base and External

User Community

Score: NA Grade: NA Weighting: 0

Objective 2.4 Performance Summary Statement:

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Goal Score: 3.30 Goal Grade: B+

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 3.0 Performance Summary Statement:

WDTS sponsored laboratory research participants evaluation data report a high quality research experience. The mentor/protégé relationship was good, the research experience met expectations, the overall laboratory experience has strengthened commitments to pursue science/math/engineering careers but needed more time actually working on their research project.

Objective 3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision

Score: 3.3 Grade: B+ Weighting: 20

Objective 3.1 Performance Summary Statement:

- Participants are exposed to the research throughout the laboratory through enrichment activities, science seminars, and collaborations with other interns.

Objective 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management

Score: 3.2 Grade: B+ Weighting: 40

Objective 3.2 Performance Summary Statement:

- Interns/educators are given an opportunities to see science career that are available to them and provided direction and encouragement to pursue them.
- The education office is fully aware of DOE and SC's future research thrusts and manages placements that are of mutual benefit to the laboratory ,and future the researcher(s).

Objective 3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs

Score: 3.4 Grade: B+ Weighting: 40

Objective 3.3 Performance Summary Statement:

- The ANL science education office is responsive to customer needs and do effectively communicate and complete program deliverables. But the visibility of the program within Argonne and the overall knowledge of science education across the complex, the office could take more of a leadership developing and sharing best practices.
- The education office is one of the most successful among the laboratories in outreach to under-represented populations and has some of the best inclusion rates from diverse groups.

Department of Energy
Washington, DC 20585

November 13, 2008

Mr. Ronald Lutha
Manager, Argonne Site Office
SC-ASO/Building 201
9800 South Cass Avenue
Argonne, Illinois 60439

SUBJECT: The Office of Energy Efficiency and Renewable Energy's Performance Evaluation of UChicago Argonne, LLC as the Management and Operating Contractor for the Argonne National Laboratory

Dear Mr. Lutha:

The Office of Energy Efficiency and Renewable Energy (EERE) has completed its evaluation of UChicago Argonne, LLC's performance in managing science and technology activities at the Argonne National Laboratory (ANL) for the performance period beginning October 1, 2007, and ending September 30, 2008. The evaluation report is enclosed for your information.

Five of the ten EERE programs, having obligated $1.0 million or more to ANL, submitted evaluations. The programs are: Biomass; Hydrogen, Fuel Cells & Infrastructure Technologies; Industrial Technologies; Solar Energy Technologies; and, Vehicle Technologies.

For fiscal year 2008, the Office of Science asked EERE to provide only numerical grades to ensure compatible scores; as a result, we used a numerical rating scale for all of the laboratories. An EERE grade of 3.1 or higher (equivalent to a B+) signifies that the laboratory's achievements toward the performance goals translate to substantive accomplishments and results.

EERE graded ANL against three performance goals. ANL received the following numerical scores (and what would be equivalent letter grades) for these goals.

Goal 1: Accomplish Mission – numerical score of 3.93, or A

Goal 2: Effective and Efficient Operation of Facilities – numerical score of 3.94, or A

Goal 3: Effective Science and Technology Research Project and Program Management – numerical score of 3.85, or A

If you have any questions concerning this evaluation, please contact [redacted]

Sincerely,

[redacted]

Deputy Assistant Secretary
for Renewable Energy
Office of Technology Development
Energy Efficiency and Renewable Energy

[redacted]

Deputy Assistant Secretary
for Energy Efficiency
Office of Technology Development
Energy Efficiency and Renewable Energy

[redacted]

Acting Deputy Assistant Secretary
Office of Business Administration
Energy Efficiency and Renewable Energy

Enclosure

cc: [redacted]
Supervisory Contract Administrator

U.S. Department of Energy

Office of Energy Efficiency and Renewable Energy

Performance Evaluation Report of the

University of Chicago for

Management and Operations of Science and Technology at the

Argonne National Laboratory

For the period October 1, 2007, to September 30, 2008

EXECUTIVE SUMMARY

The Office of Energy Efficiency and Renewable Energy (EERE) participates in the award-fee evaluation process to assess the performance of National Laboratories in the area of science and technology. This requirement originates from the annual "Standards of Performance-based Fee" clauses negotiated between the U. S. Department of Energy (DOE) and a contractor managing and operating (M&O) a National Laboratory. Existing contracts call for annual evaluations. The result of the evaluation — the overall weighted score for the science and technology goals awarded by all DOE programs — determines the percentage of the available performance-based fee that the M&O contractor earns. EERE prepared this evaluation as its input to the DOE award-fee evaluation of University of Chicago's operation of the Argonne National Laboratory (ANL). It assesses ANL's performance of work for programs in EERE from October 1, 2007, to September 30, 2008.

Each reporting EERE program that obligated $1.0 million or more to ANL during the performance period evaluated the Laboratory's performance using the Performance Goals and Objectives specified by DOE. The overall rating for each Performance Goal represents a weighted average grade of ratings received from EERE program offices. The computation uses each program's year-to-date obligations at ANL as of August 31, 2008, as the weighting factor.

The following EERE programs submitted evaluations: Biomass (BP); Hydrogen, Fuel Cells and Infrastructure Technologies Program (HFCIT); Industrial Technologies Program (ITP); Solar Energy Technologies Program (Solar); and Vehicle Technologies Program (VTP).

EERE rated ANL's performance for fiscal year 2008 with a score of 3.93 for Goal 1: Accomplish Mission; 3.94 for Goal 2: Effective and Efficient Operation of Facilities; and 3.85 for Goal 3: Effective Science and Technology Research Project and Program Management. ANL's total score for fiscal year 2008 is 3.91.

Numerical Grades by Performance Goal	**Goal 1: Accomplish Mission**	**Goal 2: Effective and Efficient Operation of Facilities**	**Goal 3: Effective Science and Technology Research Project and Program Management**
Biomass	4.10	3.00	3.83
Hydrogen, Fuel Cells and Infrastructure Technologies Program	3.96	3.40	3.87
Industrial Technologies Program	3.54	3.65	3.77
Solar Energy Technologies Program	3.55	3.50	3.47
Vehicle Technologies Program	3.95	4.30	3.87
Weighted Average Grade	**3.93**	**3.94**	**3.85**
Final Numerical Score	**3.91**		

Grades of 3.3 or higher signify that ANL's work toward a goal translates to substantive performance and results for the program. The following chart illustrates how numerical scores translate into letter grades.

Score	**0-0.7**	**0.8-1.0**	**1.1-1.7**	**1.8-2.0**	**2.1-2.4**	**2.5-2.7**	**2.8-3.0**	**3.1-3.4**	**3.5-3.7**	**3.8-4.0**	**4.1-4.3**
Grade	**F**	**D**	**C-**	**C**	**C+**	**B-**	**B**	**B+**	**A-**	**A**	**A+**

INTRODUCTION

This evaluation has been prepared as part of the DOE contractual obligation to assess University of Chicago's performance for Management and Operations of Science and Technology at ANL. Specifically, it assesses ANL's support of EERE program offices in science and technology and its ability to assist these program offices in maintaining the overall EERE mission: to strengthen America's energy security, environmental quality and economic vitality through public-private partnerships.

This evaluation report, covering the period from October 1, 2007, through September 30, 2008, comprises five sections. The first section highlights the given performance goals, objectives and measures provided to each DOE EERE technical program office. The second section addresses the process followed to grade the laboratory's performance. The third section presents the overall grades resulting from the evaluation. The fourth section lists key achievements and areas of concern. The fifth and final section provides guidance for the next performance period.

PERFORMANCE GOALS, OBJECTIVES, AND MEASURES

This evaluation focuses on grading the contractor's performance against Performance Goals as described below. Each evaluator measures progress against these Performance Goals using a set of Performance Objectives and Performance Measures, defined as follows:

- Performance Goal: This is a general overarching statement of the desired outcome for each major performance area.
- Performance Objective: An objective is a statement of desired results for an organization or activity within a major performance area.
- Performance Measure: A performance measure provides a reviewer a quantitative or qualitative method for characterizing performance to assist in assessing achievement of the corresponding Performance Objective.

The Performance Goals and Performance Objectives used by EERE, for the most part, adopt the standardized versions of goals and objectives defined by the Office of Science, as stated in the following:

- Goal 1: Accomplish Mission
    - Objective 1.1: Accomplish Mission;
    - Objective 1.2: Leadership;
    - Objective 1.3: Produce high quality, original and creative results that advance science and technology (recognition of science and technology breakthroughs);
    - Objective 1.4: Delivery.

- Goal 2: Effective and Efficient Operation of Facilities
  - Objective 2.1: Provide effective and efficient operation of facilities supporting the EERE program.
- Goal 3: Effective Science and Technology Research Project and Program Management
  - Objective 3.1: Effective program vision and leadership.
  - Objective 3.2: Effective and efficient science and technology project and program planning and management.
  - Objective 3.3: Effective and efficient communications and responsiveness to EERE and Project Management Center (PMC) needs.

EERE also adjusted the Performance Measures under Goal 1 to include success in meeting program milestones and other criteria appropriate to applied research. EERE uses only one Performance Objective under Goal 2, namely the effective and efficient operation of facilities to support EERE programs. EERE only constructs facilities at the National Renewable Energy Laboratory (NREL).

EVALUATION PROCESSES: NUMERICAL SCORES AND AVERAGING

After collecting the scores, EERE weighted them against specific program obligations for fiscal year 2008 at ANL, as reported in the DOE Standard Accounting and Reporting System as of August 31, 2008. See the following table for total funding allocated to each program.

Program Office	Year-To-Date Obligations at ANL as of August 31, 2008
Biomass	$2,265,000
Hydrogen, Fuel Cells and Infrastructure Technologies Program	$14,707,354
Industrial Technologies Program	$1,745,003
Solar Energy Technologies Program	$1,400,000
Vehicle Technology Program	$31,027,676
Total	**$51,145,033**

EERE then computed a weighted average score for each Performance Goal.
The following example illustrates the algorithm used to compute a weighted average.

Program	Numerical Score	Fiscal Year 2008 Obligations	Weighted Score
One	4.3	$2,000,000	8,600,000
Two	3.9	$20,000,000	78,000,000
Three	3.3	$6,000,000	19,800,000
SUM		**$28,000,000**	**106,400,000**
Weighted Average (Sum of Weighted Score/Sum of RY 2008 Obs)			**3.80**

OUTCOME BY PERFORMANCE GOAL

EERE rated ANL's performance for fiscal year 2008 with a score of 3.93 for Goal 1: Accomplish Mission; 3.94 for Goal 2: Effective and Efficient Operation of Facilities; and 3.85 for Goal 3: Effective Science and Technology Research Project and Program Management.

The following table highlights the numerical equivalent of the grade issued by each of the program offices by Performance Goal and the overall grade for EERE:

Numerical Grades by Performance Goal	Goal 1: Accomplish Mission	Goal 2: Effective and Efficient Operation of Facilities	Goal 3: Effective Science and Technology Research Project and Program Management
Biomass	4.10	3.00	3.83
Hydrogen, Fuel Cells and Infrastructure Technologies Program	3.96	3.40	3.87
Industrial Technologies Program	3.54	3.65	3.77
Solar Energy Technologies Program	3.55	3.50	3.47
Vehicle Technologies Program	3.95	4.30	3.87
Weighted Average Grade	**3.93**	**3.94**	**3.85**

Based upon the scores assigned by each program office for each performance goal and objective, ANL's overall final numeric score is 3.91 as calculated in the table below:

Goal	EERE Weight	Weighted Numerical Score (All Programs)	Portion of Final Score
Goal 1: Accomplish Mission	60%	3.93	2.36
Goal 2: Effective and Efficient Operation of Facilities	10%	3.94	0.39
Goal 3: Effective Science and Technology Research Project and Program Management	30%	3.85	1.16
Final Numerical Score	**3.91**		

The following chart illustrates how numerical scores translate into letter grades.

Score	0-0.7	0.8-1.0	1.1-1.7	1.8-2.0	2.1-2.4	2.5-2.7	2.8-3.0	3.1-3.4	3.5-3.7	3.8-4.0	4.1-4.3
Grade	F	D	C-	C	C+	B-	B	B+	A-	A	A+

SELECTED EXAMPLES OF ACHIEVEMENTS AND DEFICIENCIES

EERE, in the order of each Performance Goal, has highlighted selected major achievements recognized throughout fiscal year 2008. It also addresses certain areas within the ANL research and development (R&D) environment needing management attention.

GOAL 1: ACCOMPLISH MISSION with the following objectives:

- Accomplish Mission;
- Leadership;
- Produce high-quality, original and creative results that advance science and technology (recognition of science and technology breakthroughs); and
- Delivery.

SIGNIFICANT ACHIEVEMENTS

- ***Biomass***

  Objective 1.1

  - ANL's Greenhouse Gases, Regulated Emissions and Energy Use in Transportation (GREET) model has been used by many organizations for evaluating the lifecycle greenhouse gas emissions associated with a variety of fuels, including biofuels. The model is available to the public and there are approximately 9,000 users of GREET around the world. The model is being utilized by many organizations both in the private sector and in government agencies for state-of-technology assessments, regulatory analysis, and international comparisons. The program has furnished invited speakers, conference chairs, or recognized

experts in a number of areas as follows: plenary speech at Illinois Agronomy Day, panel chair on chemicals from biomass at Illinois Biotechnology Industrial Organization's annual meeting, and the Illinois Biotech Group's Council for Chemical Research conference on Biobased Feedstocks. ANL staff gave an invited presentation on biomass at the first Midwest Alternative Energy Venture Forum, gave an invited panel presentation on commercial biomass opportunities at the Chicago Fed Reserve's First Clean Tech Forum, and served on the steering and/or advisory committee for several Midwest biomass R&D centers.

Objective 1.2

- The U.S. Environmental Protection Agency is using the GREET model as one of its analytical tools to determine the lifecycle greenhouse gas emissions associated with biofuels. The California Air Resources Board is also using the model as part of its proposed Low Carbon Fuel Standard regulation. General Motors (GM) has endorsed the model as the "gold standard" in the lifecycle evaluation area. Michael Wang of ANL has worked collaboratively with the U.S. Department of Agriculture to incorporate better data and methodologies into the model. There is interest from the Department of Defense to utilize this framework for the evaluation of greenhouse emissions from aviation fuels.

Objective 1.3

- Under the leadership of [redacted], the GREET model has undergone significant improvements in the last few years. There is better representation of distillers' dry grains with solubles (DDGS) in the model. DDGS is an important co-product of the ethanol conversion process and accurate accounting of this animal feed supplement has significant implications in terms of accounting for greenhouse gas impacts of ethanol. [redacted] has also begun the process of accounting for direct and indirect land use changes associated with biofuels. This work is being done in a collaborative effort between Argonne and Purdue University. Incorporation of land use changes in the model will make GREET an even more valuable tool for greenhouse gas analytical activities.

Objective 1.4

- [redacted] and [redacted] at Argonne have been extremely responsive to quick turn-around tasks as required by DOE headquarters. These tasks often arise at the last minute and require careful review and rapid response. Headquarters staff can rely upon [redacted] and [redacted] to provide this type of response. Even when on travel, they can be available for discussions and questions. [redacted] has responded within hours from China to e-mail enquiries from [redacted].

- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***

Objective 1.1

- Task Title: Non-Platinum Bimetallic Cathode Electrocatalysts. The following accomplishments were realized in fiscal year 2008:
  - Calculated preferred reaction pathways and barriers for two possible O_2 reduction reaction mechanisms on slabs of pure metals using density functional theory: a dissociative mechanism through -OH formation and an associative mechanism through -OOH formation.

- Calculated reaction force field potentials for Pd (palladium) and PdCu (a palladium-copper alloy).
- Determined effect of Pd particle size (1.2 to 20 nm) on oxygen reduction reaction (ORR) kinetics--5 nm particle size shows highest ORR mass activity.
- Synthesized and characterized a series of PdCu, PdNi (a palladium-nickel alloy), PdFe (a palladium-iron alloy) catalysts via co-impregnation; determined the effect of Pd to base metal ratio, post-deposition heat treatment temperature and atmosphere, and acid treatment.
- Developed a strong electrostatic adsorption technique for PdCo (a palladium cobalt alloy) and achieved Co core-Pd shell structure.
- Developed a colloidal technique for PdCu; synthesized and characterized a series of colloidal PdCu catalysts.
- Determined that Cu modifies the valence band density of states of Pd.
- Achieved factor of 3.75 improvement in ORR activity of PdCu/C catalyst by using alternative colloidal technique.
- Achieved ORR mass activity of approximately 75 percent that of commercial Pt/C with PdCu/C catalyst (@800 mV).

- Task Title: Polymer electrolyte membrane fuel cell using Aligned Carbon Nanotubes as Electrodes in membrane electrode assemblies (MEAs). Methods of preparing dense, uniform aligned carbon nanotubes (ACNT) layers with adjustable thickness were successfully developed using chemical vapor deposition (CVD) technique. A variety of solution impregnation methods were developed to catalyze ACNTs with good metal dispersion. A co-CVD process was developed to functionalize ACNT by directly depositing Pt through a gas phase reaction. MEA fabrication method was successfully developed to transfer ACNT to Nafion® membrane. ACNT-MEA showed improved performance over commercial product in single cell tests.
- Task Title: Fuel Cell Testing. Characterized a 1-kW stack for sensitivity to operating conditions. The maximum power the stack developed was 1332 Watts at ambient pressure, achieving a thermodynamic efficiency of 53.8 percent. At 25 percent of rated power, the efficiency increased to 65.6 percent. ANL characterized two 5-kW complete systems. ANL staff participated in and made technical presentations at the second meeting of the International Standards Organization (ISO) Working Group 11 under Technical Committee 105 of the International Electrotechnical Commission, held on December 17-18, 2007, in Frankfurt am Main, Germany. The goal of this international group is to draft the technical specification of a single-cell test protocol. Representatives from six countries attended. The lab upgraded the test facility by replacing the air supply subsystem to provide clean, hydrocarbon-free air to the fuel cells or systems under test.
- Task Title: System Level Analysis of Hydrogen Storage Options.
  - Updated the storage capacity of the cryo-compressed Gen 2 system with data from technology developers.
  - Revised analysis of the storage capacity of the cryogenic activated carbon system to reflect 2010 and 2015 delivery pressure targets.

- Determined the intrinsic capacities, thermodynamics, and water and heat management requirements for on-board sodium borohydride hydrolysis (SBH) storage system.
- Evaluated the overall fuel cycle efficiency of SBH regeneration using flowsheets proposed by Millennium Cell and Rohm and Haas, and provided input to DOE and the independent Systems Integrator on DOE's go/no-go decision for SBH.
- Conducted systems analysis to determine the extrinsic capacities, thermodynamics, and decomposition kinetics of alane (aluminum hydride) in slurry form.
- Completed preliminary energy and efficiency analysis of off-board regeneration requirements.
- Conducted preliminary analysis of regeneration of an organic liquid carrier and determined the overall fuel cycle efficiency.
- Performed preliminary energy and efficiency analysis of ammonia borane (AB) regeneration using a scheme developed by the DOE Chemical Hydrogen Storage Center of Excellence.
- Identified processes that consume a significant amount of energy in regeneration and provided feedback to the Center.

- Task Title: Fuel Cell Systems Analysis.
  - Analyzed the performance of stacks with the 3M nanostructured thin film catalysts and determined the optimum operating pressures and temperatures.
  - Analyzed experimental data for Honeywell's integrated compressor-expander module (CEM) and developed a scalable compressor map and scalable expander maps for different nozzle areas.
  - Proposed and analyzed alternative CEM configurations capable of approaching the maximum parasitic power target of 5.4 kW for an 80-kW fuel cell system.
  - Analyzed the performance of advanced radiators with metal foams, high-density louver fins and microchannel plain fins.
  - Identified a compact radiator design with the lowest pumping power.
  - Analyzed the performance of enthalpy wheel humidifiers at part load and at different rotational speeds.
  - Analyzed the performance of a membrane humidifier and determined the conditions of optimum operating temperature and pressures at part load.
  - Compared the performance of two fuel cell systems, one with an enthalpy wheel humidifier and the other with a membrane humidifier.
- Hydrogen Quality Issues for Fuel Cell Vehicles: Conducted a fuel quality modeling workshop to discuss pressure swing adsorption (PSA) and fuel cell impurity effects modeling (August 2007). Participated in ISO Working Group 12 meetings and held in-depth discussions on modeling impurity effects on fuel cell systems (November 2007 and April 2008). Presented and discussed Hydrogen Quality Working Group activities at several FreedomCAR and Fuel Partnership's Technical Team meetings and at other forums (May 2007, June 2007, October 2007, November 2007, January 2008, and April 2008).

Developed PSA performance models for different design and operating conditions and levels of various contaminants in product H_2. Developed methodology to evaluate effect of impurity level on hydrogen production cost, using H_2A.

- Hydrogen Well-to-Wheels Analysis: Supported early market analysis of fuel cell powered fork lifts and distributed power with comparative well-to-wheel analysis of competing technologies. The GREET model was modified to include these early market pathways. The project milestone was achieved. Well-to-wheel analysis was developed for gasoline and hydrogen plug-in hybrids. Various regional electrical supplies and hydrogen production pathways were included in the analysis. The GREET model was updated to include the plug-in vehicle option. The project milestone was achieved.
- Hydrogen Delivery Modeling: The second version of the Hydrogen Delivery Scenario Analysis Model (H2A Delivery model) was issued in March.

Objective 1.2

- Argonne organized and hosted meetings of DOE's Hydrogen Quality Working Group and a workshop on Hydrogen Fuel Quality with participation from Canada and Japan. Argonne led and coordinated the DOE Hydrogen Storage Systems Analysis Working Group. Argonne organized and hosted a market transformation workshop for the deployment of fuel cells at national lab facilities. As examples of collaborative efforts that enhance the effectiveness and productivity of the Laboratory's efforts, Argonne conducted collaborative hydrogen and fuel cell research with numerous industry and university partners, including Los Alamos National Laboratory, Oak Ridge National Laboratory, NREL, Chevron, BP, Shell, GM, Ford, Chrysler, Caltech, University of Chicago, University of Nevada, Las Vegas, Johns Hopkins University, University of Illinois, Northern Illinois University, Kettering University, Japan Institute of Energy, REB Research and Consulting, American Science and Technology, Chicago State University, General Electric, Taiwan Industrial Technology Research Institute, and International Energy Agency Fuel Cell Annex Participants. Argonne's work has opened new opportunities and changed the direction of research in the hydrogen and fuel cell fields. Argonne attracts the highest quality researchers, Post-Docs, and research partners.

Objective 1.3

- Argonne inventions and patents are indicative of the original and creative outputs resulting from Argonne's EERE-sponsored work. Eight invention disclosures were documented in fiscal year 2008. Five patent applications were filed and two patents were granted in fiscal year 2008. Argonne staff presented invited talks at major national and international conferences that have generated significant interest and awareness in the hydrogen and fuel cell field.

Objective 1.4

- Argonne conducted research under 32 agreements in 18 project areas during fiscal year 2008 for the HFCIT Program. Multiple milestones per agreement were defined in the Annual Operating Plan (AOP). Out of 81 total milestones, 76 milestones were completed on time or are on track to be completed on time. Quarterly technical reports, monthly cost reports, and inputs for the program annual report were submitted in a timely manner.

- ***Industrial Technologies Program***

  Objective 1.1

  - Argonne has demonstrated excellent applied research capabilities in the area of advanced reciprocating engine system R&D through the use of state-of-the art technical capabilities.

  Objective 1.2

  - Argonne has shown that it is effective in responding to revisions in priorities with respect to the change from the Office of Electricity to EERE. They have established excellent collaboration with the leading private sector engine manufacturers.

  Objective 1.3

  - Argonne has developed important understandings on elements critical to meeting the challenging goals of the advanced reciprocating engine systems (ARES) effort. Of particular note is the progress made in understanding laser-based ignition processes.

  Objective 1.4

  - None

- ***Solar Energy Technologies Program***

  Objective 1.1

  - Good work.

  Objective 1.2

  - Good work.

  Objective 1.3

  - None

  Objective 1.4

  - Argonne has met all its milestones.

- ***Vehicle Technologies Program***

  Objective 1.1

  - Vehicle Systems: The ANL Vehicle Systems Group consists of three major functional sections: Powertrain Modeling and Simulation, Component Hardware-in-the-Loop Testing, and Advanced Vehicle Performance Testing. Each element of ANL's testing disciplines is designed to address DOE's mission as stated in the plug-in hybrid electric vehicles (PHEV) R&D Plan. The combination of researcher skill sets, outstanding test facilities, and advanced instrumentation ensures world-class research capabilities. ANL's project design and technical deliverables were highly rated in DOE merit reviews in fiscal year 2008. Project progress reports were submitted regularly. ANL project reviews were presented to DOE management on a quarterly basis. In addition, Glenn Keller scheduled Vehicle Systems Group project updates with the DOE VTP for more in-depth descriptions of project outcomes every five weeks.

    In support of DOE outreach and data dissemination requirements, ANL conducted more than 40 presentations on vehicle testing results and computer model simulations at industry gatherings, electric utilities, and to public, private, government and vehicle manufacturer groups. In further support of public dissemination requirements, ANL researchers gave interviews to local and national press organizations including Business Week, Automotive

News, MSNBC, Discovery Channel, Public Television, regional newspapers, and foreign press interests. Laboratory staff also acted as vehicle testing information resources to other government agencies such as the National Science Foundation, California Air Resources Board, Environmental Protection Agency, Department of Transportation, and Department of Defense.

- Advanced Combustion and Emissions Control: The funding support from the Advanced Combustion and Emissions Control program was split into the following four agreements: Fuel spray research using X-rays at the Advanced Photon Source, light duty engine combustion research using the GM 1.9 liter diesel engine, hydrogen fueled light duty engine research in collaboration with Ford and Sandia National Laboratories, and a Cooperative Research and Development Agreement (CRADA) effort on diesel particulate filter (DPF) with Corning and Caterpillar. The hydrogen fueled light-duty engine team demonstrated a pathway to achieve the 45 percent thermal efficiency goal of the VT Program. Successful completion of BMW Hydrogen 7 vehicle testing - project was initiated because of ANL's hydrogen engine expertise. Water injection on hydrogen engines was shown to significantly reduce nitrogen oxide emissions (50 percent and more). Exhaust gas recirculation will be implemented as a more practical solution. Joint publications between Sandia National Laboratories and ANL were based on close collaboration and the exchange of hardware (e.g. costume-designed fuel injectors). BMW R&D is interested in joining the Ford/ANL/Sandia consortium for hydrogen engine research. The on-going progress of fuel spray research using X-rays continues to be the large attraction of the worldwide research community and a top researcher from Bosch, the world's largest manufacturer of fuel injection systems, visited and worked with ANL researchers for six weeks. ANL initiated a new collaboration with the Engine Research Center (ERC) at the University of Wisconsin. A Ph.D. student from ERC will spend an extended period at Argonne in 2009 and will participate in spray measurements. The student will then use the data to validate and improve ERC's engine modeling code. Unprecedented assistance was given by GM. The GM engine is operating flawlessly and ANL expects to generate critical data in fiscal year 2009. The engine was extensively baselined to provide a complete stock vehicle-level engine performance map, which matched the GM original map to within 3 percent for power, load, fuel efficiency, and emissions performance. Peak brake thermal efficiency of the stock engine was verified to be 42 percent. Support received from GM includes a complete engine performance map to initiate the programming of an open engine controller, machining of a new cylinder head to accommodate endoscopic combustion chamber access, and machining 36 piston crowns to allow for changing the compression ratio of the engine to four different levels.
- Argonne staff produced ten peer reviewed publications in leading professional journals. Several staff members were invited to give lectures nationally and internationally. Technical lectures were given in India, South Korea, and Japan. This gives positive publicity to EERE/ VT programs. For the first time, ANL has entered into a cost-shared CRADA with two major manufacturers, Caterpillar and Corning, to conduct research in advanced DPF. This grew out of the leading edge morphology and chemistry research with the innovative thermophoretic sampling system. The DPF test facility has been developed and integrated with the GM light-duty engine to collect particulate matter (PM) emissions. First observation of PM filtration has successfully been obtained by using a microscopic imaging system. Major international manufacturers such as Toyota, Hyundai, and Honda have

contacted ANL's Principal Investigator on his PM morphology research. Cost shared collaborative research with international sponsors is a distinct possibility.

- Energy Storage: In fiscal year 2008, ANL researchers published more than 40 papers related to lithium battery R&D in referenced technical journals and gave presentations at several international and/or national technical meetings and symposia.
- Lightweight Materials Technology Completion of Plastics Recycling CRADA: In the VT Lightweighting Material thrust, ANL completed, in August 2008, a five-year CRADA with the Vehicle Recycling Partnership (the automotive-recycling-focused consortium of the United States Council for Automotive Research and the American Chemistry Council Plastics Division (the main trade association of the automotive-plastics supplier industry). In this five-year effort, several technologies have been developed for the economical recycling of post-consumer (i.e., end-of-life vehicle) plastics scrap.
- Commercialization of Post-Consumer Plastics-Recycling Technology: A shredder firm in the Midwest has agreed to commercialize technologies developed at ANL for recovering post-consumer plastics scrap usually relegated to land fills. The shredder firm will pay for the bulk of the commercialization with technology-transfer assistance from ANL under VT-LM funding. The significance of the two achievements above is that a long-held perceptional barrier to the increased use of lightweighting polymer-based materials in vehicles may have been removed.
- Light-Metals Recycling Workshop: ANL organized and held, on September 24, 2008, a workshop to look at the issue of recycling light metals like aluminum (Al) and magnesium (Mg). Automotive steels have a significant competitive advantage over such light metals because most automotive steels can be melted together, from which base new steels can be made very cost-effectively. The workshop looked at the state-of-the-art for economically recycling the various Al and Mg alloys directly back to their original alloy without melting together. ANL is now developing a roadmap plan for evaluating the current technologies or developing new technologies for this purpose.

Objective 1.2

- Vehicle Systems: ANL is recognized as DOE's leading research laboratory for vehicle testing activities for emerging technologies such as PHEVs and major powertrain components. Moreover, ANL has been recognized for its excellence in advanced vehicle research by the automotive original equipment manufacturers (OEMs)--both domestic and foreign), by major component suppliers, and other industry trade groups such as the Electric Power Research Institute, Society of Automotive Engineers, etc. Recently, ANL's programs have been the recipient of several R&D 100 awards for excellence. Argonne closely coordinates vehicle testing activities through its collaboration with Idaho National Laboratory (INL), and provides test results and test vehicle components to NREL and Oak Ridge National Laboratory. ANL/INL collaboration on data acquisition and analysis of real world driving cycles and the comparison of results from standardized lab dynamometer testing with fleet testing demonstrates the synergistic value of cooperative research to enhance the state of knowledge on vehicle testing. The Advanced Vehicle Testing Activity (AVTA) Program utilizes the assets of both ANL and INL for cost-effectively testing advanced vehicles by sharing test scheduling and collaborating on performance data and system depreciation.

- Advanced Combustion Engine Technologies: ANL received recognition from the European Hydrogen Internal Combustion Engine consortium for doing outstanding research in hydrogen fueled engines. Joint publications in prestigious journals with Sandia National Laboratories resulted from this project. In X-ray based fuel spray characterization, ANL continues to be the recognized leader. Several engine and fuel systems manufacturers have contacted ANL with the prospect of establishing new collaborations. These include Delphi, Bosch GDI, Convergent Science, and Chrysler.
- Energy Storage: ANL organized and hosted the 1st International Conference on Advanced Lithium Batteries for Automobile Applications. The objectives of the conference, attended by more than 400 battery researchers representing industries, academic institutions, and governments from around the world, were to enhance the global effort on R&D of advanced lithium batteries for automobile applications; accelerate the discussion and communication of R&D progress, achievement and problems; and further strengthen the global collaboration in this important and challenging field.

Objective 1.3

- Vehicle Systems: As DOE's only integrated vehicle systems testing activity, the Center for Transportation Research at ANL designs creative testing methods for emerging technologies that act as benchmarks to DOE and industry alike. It allows DOE to gauge industry advancements of technologies such as PHEVs. Argonne staff conscientiously examines the quality and completeness of their data and reporting practices. The lab maintains an on-line database of test results organized to allow ease of user access and provides hybrid electric vehicle (HEV) auxiliary subsystems testing results to other DOE laboratories in support of developing and changing modeling parameters. ANL also conducts testing of emerging technologies that requires development of testing procedures and unique instrumentation that must creatively balance laboratory and INL field testing constraints.
- Advanced Combustion Engine Technologies: The demonstration of 45 percent thermal efficiency in a light duty engine is a major breakthrough for the ANL-Ford-Sandia National Laboratories team. The unique DPF testing facility has successfully been tested in connection with a light-duty diesel engine. More than 10 high quality technical papers of permanent reference value were published by major societies such as the American Society of Mechanical Engineers and the Society of Automotive Engineers. ANL's contribution of deployable technologies was evident from the exchange of personnel with Bosch and a steady stream of invitations to ANL staff to visit and give lectures at prestigious national and international institutions.
- Energy Storage: ANL and an industrial partner, EnerDel, Inc., were presented with an R&D 100 award for the joint development of an advanced, high-power lithium-ion battery system, recognized by *R&D Magazine* as one of the year's most significant technological innovations. ANL has developed and licensed a family of advanced, lithiated mixed metal oxide layered composite cathode materials and associated processing technology to Toda Kogyo Corporation, a major supplier of lithium-ion battery materials. The new cathode material possesses enhanced stability compared to conventional cathode materials.

Objective 1.4

- Vehicle Systems: ANL meets unscheduled and unanticipated information requests, which are often generated by DOE management, within timelines requested. The Argonne Vehicle

Systems Team met all scheduled milestones with several significant milestones completed early, including the revision of PHEV component R&D goals for the PHEV R&D Plan.

- Advanced Combustion Engine Technologies: The delivery of results was good. ANL staff participated in many national and international conferences as authors, organizers and conference chairmen. The demonstration of BMW hydrogen fueled vehicles was a resounding success. The ANL staff took part in DOE's Merit Review and the Combustion Memorandum of Understanding meetings organized by Sandia National Laboratories. Technology transfer to industry by direct participation of industry researchers in ANL's fuel spray experiments was very effective.

NOTABLE ACHIEVEMENTS

- ***Biomass***

  Objective 1.1

  - None

  Objective 1.2

  - None

  Objective 1.3

  - None

  Objective 1.4

  - None

- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***

  Objective 1.1

  - Pressurized Steam Reforming of Bio-Derived Liquids for Distributed Hydrogen Production: ANL quantified the improvement in yield resulting from the permeation of hydrogen from a reforming zone operating at elevated pressures. The lab demonstrated the effectiveness of the catalyst on the conversion/ suppression of C2 hydrocarbons. They set up and validated a mathematical model of their membrane reactor, which can now be used to predict conditions necessary to meet hydrogen production rates consistent with efficiency targets.

  Objective 1.2

  - Argonne hosted a meeting of the Hydrogen Production Technical Team under the FreedomCAR and Fuel Partnership.

  Objective 1.3

  - None

  Objective 1.4

  - None

- ***Industrial Technologies Program***

  Objective 1.1

  - None

  Objective 1.2

  - None

Objective 1.3

- None

Objective 1.4

- Although hampered somewhat by the changes involved in the transition from the Office of Electricity to EERE, Argonne has done a good job in resuming research associated with the ARES effort.

- ***Solar Energy Technologies Program***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

- ***Vehicle Technologies Program***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- Energy Storage: ANL developed in-situ diagnostics techniques and demonstrated that kinetic limitations were the main cause of the degradation in performance seen in lithium-ion cells operating at low temperature. Argonne scientists developed and used new diagnostic tools in unique ways to investigate phenomena that limit the life and performance of lithium-ion cells being developed for use in HEVs. They recently achieved significant progress in understanding factors responsible for the gradual performance loss observed during long-term aging of high-power cells that employ nickel-manganese-cobalt mixed metal oxide cathodes.

Objective 1.4

- Vehicle Systems: Argonne meets DOE expectations for completing testing assignments in agreed to schedules and complies with all reporting deadlines for progress reports and status updates
- Energy Storage: Reviews of the Energy Storage Programs are held every four months and are well regarded by program participants and outside reviewers for their thorough coverage of program activities and accomplishments.

NOTABLE DEFICIENCIES

- ***Biomass***
  - ***Objective 1.1***
    - None
  - ***Objective 1.2***
    - None
  - ***Objective 1.3***
    - None
  - ***Objective 1.4***
    - None
- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***
  - ***Objective 1.1***
    - None
  - ***Objective 1.2***
    - None
  - ***Objective 1.3***
    - None
  - ***Objective 1.4***
    - None
- ***Industrial Technologies Program***
  - ***Objective 1.1***
    - None
  - ***Objective 1.2***
    - None
  - Objective 1.3
    - None
  - ***Objective 1.4***
    - None
- ***Solar Energy Technologies Program***
  - ***Objective 1.1***
    - None
  - ***Objective 1.2***
    - None
  - ***Objective 1.3***
    - None

Objective 1.4

- None

- ***Vehicle Technologies Program***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

SIGNIFICANT DEFICIENCIES

- ***Biomass***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

- ***Industrial Technologies Program***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

- ***Solar Energy Technologies Program***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

- ***Vehicle Technologies Program***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

SUPPORTING COMMENTS

- ***Biomass***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

- ***Industrial Technologies Program***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

- ***Solar Energy Technologies Program***

Objective 1.1

- None

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

- ***Vehicle Technologies Program***

Objective 1.1

- ANL serves as the coordinating laboratory for a multimillion dollar battery R&D program that uses the resources of four other National Laboratories and three universities to address cross-cutting barriers facing the lithium-ion systems that are closest to meeting the technical energy and power requirements for hybrid electric vehicles and plug-in hybrid electric vehicles.

Objective 1.2

- None

Objective 1.3

- None

Objective 1.4

- None

GOAL 2: EFFECTIVE AND EFFICIENT OPERATION OF FACILITIES with the following objective:

- Provide effective and efficient operation of facilities supporting the EERE Program.

SIGNIFICANT ACHIEVEMENTS

- ***Biomass***

  Objective 2.1

  - None

- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***

  Objective 2.1

  - Argonne operates a one-of-a-kind fuel cell test facility, unique among National Laboratories, with capabilities for evaluating full-size automotive fuel cell systems of up to 100 kW in size. Leveraging EERE's previous investment in battery testing capability has allowed Argonne to operate the fuel cell facility with a high level of efficiency and effectiveness. Testing was carried out on cutting-edge fuel cell stacks and systems from industrial developers to benchmark progress in the technology and to identify areas of further research and development needs. Test data and reports were provided to DOE/EERE and to the respective fuel cell developers. ANL upgraded the test facility by replacing the air supply subsystem to provide clean, hydrocarbon-free air to the fuel cells or systems under test. The lab characterized a 1-kW stack for sensitivity to operating conditions. The maximum power the stack developed was 1,332 watts at ambient pressure, achieving a thermodynamic efficiency of 53.8 percent. At 25 percent of rated power, the efficiency increased to 65.6 percent.

- ***Industrial Technologies Program***

  Objective 2.1

  - None

- ***Solar Energy Technologies Program***

  Objective 2.1

  - None

- ***Vehicle Technologies Program***

  Objective 2.1

  - Vehicle Systems: ANL operates and maintains one of the most advanced four-wheel chassis dynamometers in the country and utilizes this facility on a daily basis for the conduct of vehicle and component evaluations for the VTP. The lab minimizes costs to DOE by arranging testing partnerships with outside private and government entities that allow access to private and state of the art test labs and facilities. ANL also interacts with Idaho National Laboratory and Oak Ridge National Laboratory to ensure the Argonne testing facilities are fully utilized. They use non-DOE owned vehicles from the New York State Energy Research

and Development Authority, Environment Canada, PHEV converters, and auto OEMs to minimize testing and facility costs to DOE.

- Advanced Combustion Engine Technologies: All the facilities assigned to the combustion and emissions project were available promptly. The test equipment is up-to-date and capable of measuring all criteria pollutants with a high degree of accuracy. The X-ray spray visualization facility is one-of-a-kind and provides data used by many industrial partners.
- Energy Storage: ANL maintains a world-class facility for testing advanced batteries under a variety of charge-discharge regimes and temperatures in order to provide DOE, United States Advanced Battery Consortium, and battery developers with reliable, independent, and unbiased performance evaluations of cells, modules, and battery packs.

NOTABLE ACHIEVEMENTS

- ***Biomass***

  Objective 2.1

  - Argonne has done the best it can with the small program it has with Biomass. ANL's analysis capabilities are significant and they are working toward developing a user facility to accommodate the Biomass Program's hybrid technologies, in particular syngas fermentation. Constructing this facility remains a goal of the management if additional funds are available.
- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***

  Objective 2.1

  - None
- ***Industrial Technologies Program***

  Objective 2.1

  - None
- ***Solar Energy Technologies Program***

  Objective 2.1

  - None
- ***Vehicle Technologies Program***

  Objective 2.1

  - None

NOTABLE DEFICIENCIES

- ***Biomass***

  Objective 2.1

  - None

- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***
  - ***Objective 2.1***
    - None
- ***Industrial Technologies Program***
  - ***Objective 2.1***
    - None
- ***Solar Energy Technologies Program***
  - ***Objective 2.1***
    - None
- ***Vehicle Technologies Program***
  - ***Objective 2.1***
    - None

SIGNIFICANT DEFICIENCIES

- ***Biomass***
  - ***Objective 2.1***
    - None
- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***
  - ***Objective 2.1***
    - None
- ***Industrial Technologies Program***
  - ***Objective 2.1***
    - None
- ***Solar Energy Technologies Program***
  - ***Objective 2.1***
    - None
- ***Vehicle Technologies Program***
  - ***Objective 2.1***
    - None

SUPPORTING COMMENTS

- ***Biomass***
  - ***Objective 2.1***
    - None
- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***
  - ***Objective 2.1***
    - There have been some safety issues with hydrogen and with the fuel cell test facility, but ANL has taken measures to prevent any damage to personnel or

infrastructure and to correct problems with the facility. ANL management notified DOE appropriately and conducted a thorough safety investigation.

- ***Industrial Technologies Program***

  Objective 2.1

  - None

- ***Solar Energy Technologies Program***

  Objective 2.1

  - None

- ***Vehicle Technologies Program***

  Objective 2.1

  - None

GOAL 3: EFFECTIVE SCIENCE AND TECHNOLOGY RESEARCH PROJECT AND PROGRAM MANAGEMENT with the following objectives:

- Effective program vision and leadership.
- Effective and efficient science and technology project and program planning and management.
- Effective and efficient communications and responsiveness to EERE and PMC needs.

SIGNIFICANT ACHIEVEMENTS

- ***Biomass***

  Objective 3.1

  - [redacted] has assembled an excellent team at Argonne to respond to DOE Headquarter (HQ) needs. [redacted] and [redacted] provide support and complement the GREET activities. [redacted] is involved in a report on water requirements for biofuels which has already generated considerable interest among stakeholders. [redacted] is involved in a water remediation project involving hybrid poplars. [redacted] has supported life cycle assessment activities at EPA, California Air Resources Board, and the U.S. Department of Agriculture. Significant expansion activities are planned for the GREET model to make it more user friendly and to better incorporate direct and indirect land use change impacts.

  Objective 3.2

  - [redacted] has a vast amount of expertise in the life cycle arena and has worked in this area for so long that he knows the technical issues that need to be considered in this type of analysis. This is an invaluable resource for DOE headquarters staff because often they have to respond to analysis and assessments done by others and they utilize [redacted] knowledge and expertise to respond to work by the academic community as well as by industry and other government agencies.

  Objective 3.3

  - The program provides an adequate level of input to HQ and the Project Management Center. ANL is often asked to perform analysis and provide responses to upper level management, Congress, the White House, and other stakeholders. The lab relationship manager, [redacted] maintains a good level of communications through attendance at staff meetings and e-mail to technical managers.

- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***

  Objective 3.1

  - Argonne staff participated as members of the Fuel Cell Technical Team and the Hydrogen Storage Technical Team under the FreedomCAR and Fuel Partnership. This joint planning with partners, collaborators, and stakeholders was successful in more effectively focusing the research and enhancing EERE program efforts. Argonne displayed scientific and technical leadership as the operating agent and key participant in two annexes under the International Energy Agency's Advanced Fuel Cells Implementation Agreement. Argonne displayed scientific and technical vision by presenting its research results at major hydrogen and fuel cell conferences (Fuel Cell Seminar, National Hydrogen Association, Electrochemical Society, inter alia) to maximize the value of the research and development results and to gain appropriate recognition for DOE, EERE, HFCIT, and the Laboratory.

  Objective 3.2

  - Argonne prepared and submitted high-quality R&D plans, i.e. Field Work Proposals (FWPs) and AOPs, which identified the technical risks and proposed approaches to minimize the technical risks. With regard to safety, experimental safety reviews were written, reviewed, and approved prior to the beginning of any experimental project. The

safety reviews are based on and fully implement the principles of Integrated Safety Management. Argonne staff provided technical evaluation and support in the planning, development, and execution of EERE roadmaps and program plans, including documenting the progress of the EERE programs towards meeting the long-term performance, cost, and durability targets.

Objective 3.3

- Argonne promptly reported to DOE program managers a safety-related incident involving a major hydrogen leak in a vendor-supplied hydrogen gas storage tank. Oral and written reports were provided.

- ***Industrial Technologies Program***

  Objective 3.1

  - Argonne has established itself as a lead organization in the development of advanced reciprocating internal combustion engines. They have enabled the Industrial Technologies Program to resume the important Advanced Reciprocating Engine Systems effort following transfer from the Office of Electricity.

  Objective 3.2

  - Argonne has effectively resumed pursuit of the important technical issues associated with high efficiency reciprocating engines following transition from the Office of Electricity to EERE.

  Objective 3.3

  - Argonne has proven sensitive to the needs of the Industrial Technologies Program with relation to the transfer of their activities from the Office of Electricity to EERE. Through their efforts they have enabled the Advanced Reciprocating Engine Systems effort to resume with minimal disruption.

- ***Solar Energy Technologies Program***

  Objective 3.1

  - Good work.

  Objective 3.2

  - None

  Objective 3.3

  - None

- ***Vehicle Technologies Program***

  Objective 3.1

  - Vehicle Systems: ANL effectively plans new research programs with an eye towards predicting the industry's and DOE's needs for advanced technology development. The lab consults multiple stakeholders, and monitors technology introductions in Europe and Asia, to help us develop our vision. Many examples exist (like the ANL designed robust PHEV data acquisition recorders) where ANL efforts had a new process or testing methodology in-place in advance of the DOE's needs.
  - Advanced Combustion Engine Technologies: Top quality research staff, 90 percent with Ph.D.s in engineering, are available at ANL for this program. ANL invests significant

laboratory directed research and development funds to promote EERE programs. All projects have major industrial partners to commercialize our technologies. X-ray spray diagnostics were conceived at ANL and numerous industrial partners have used this facility. ANL started the Hydrogen Internal Combustion Engine R&D project with Ford, which has produced significant results.

Objective 3.2

- Vehicle Systems: ANL designs testing methodologies and procedures for vehicle technologies, such as PHEVs and unique alternative fuels, and makes tradeoffs between costs, technical risks, and information requirements when designing testing programs. ANL also provides all FWPs and annual reports to Congress as requested. ANL highly leverages DOE testing funding with other entities, such as the AVTA/Idaho National Laboratory PHEV demonstration and testing fleets, in order to create research synergies.
- Advanced Combustion Engine Technologies: ANL kept current the AOPs and FWPs and followed strictly DOE guidelines. The lab makes a deliberate effort to bridge the gap between basic science disciplines and applied engineering research. ANL provided timely inputs to the Corporate Planning System at EERE. ANL management took an active part in interacting with the Office of Science's Basic Energy Sciences Program in building a bridge between basic and applied research.

Objective 3.3

- Vehicle Systems: ANL provides responses to requests for information from DOE and Congress that range from PHEV fuel efficiency surveys, to PHEV and other advanced vehicles' impacts on petroleum displacement and greenhouse gas abatement, to technology assessments. Specific requests have included information for the General Accountability Office and the House Ways and Means Committee on various aspects of PHEV performance and cost on extremely short response deadlines. ANL generates weekly updates to headquarters on all positive and negative testing events and industry interactions. The lab supports the DOE PHEV Technology Acceleration and Demonstration Activity selection process with technology proposal reviews.
- Advanced Combustion Engine Technologies: DOE has a single point of contact at ANL regarding this program. All results were timely, and concerns were promptly resolved. Through active participation with the external research community, ANL provided quick and accurate responses to inquiries.

NOTABLE ACHIEVEMENTS

- ***Biomass***

  Objective 3.1

  - None

  Objective 3.2

  - None

Objective 3.3

- None

- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***

  Objective 3.1

  - None

  Objective 3.2

  - Argonne project managers undertook training and achieved proficiency with the EERE Corporate Planning System for tracking projects and agreements.

  Objective 3.3

  - High-quality quarterly technical progress reports and monthly cost reports were prepared and submitted to HQ in a timely manner. Well-written technical contributions were prepared for the Hydrogen Program Annual Progress Report. Numerous high-quality technical research results were presented at the Hydrogen Program's Annual Merit Review & Peer Evaluation, in both oral and poster presentations. Argonne staff responded to EERE and Project Management Center needs by providing high-quality reviews of technical proposals submitted in response to DOE solicitations. Argonne kept HQ fully informed regarding high-profile visits to Argonne (by Assistant Secretary [redacted], [redacted], et al.) and by various members of Congress and their staff.

- ***Industrial Technologies Program***

  Objective 3.1

  - None

  Objective 3.2

  - None

  Objective 3.3

  - None

- ***Solar Energy Technologies Program***

  Objective 3.1

  - Argonne has been responsible, under the joint management directives of DOE and the Bureau of Land Management (BLM), for the development of a Solar Programmatic Environmental Impact Statement (PEIS). This includes several notable achievements, including arranging and facilitating 11 public scoping meetings, establishing and populating a SOLAR PEIS web site, and coordinating activities with the DOE and BLM (co-leads in the PEIS).

  Objective 3.2

  - None

  Objective 3.3

  - None

- ***Vehicle Technologies Program***

  Objective 3.1

  - Energy Storage: ANL spearheaded a multi-institutional effort, involving four National Laboratories and two universities, to develop and apply novel diagnostic tools to identify factors that contribute to the degradation in battery cell performance that takes place as the cells are cycled. Researchers from ANL and NREL collaborated on the conduct of vehicle analyses and battery sizing studies that were the basis of the battery performance requirements used when soliciting proposals from potential battery developers and for benchmarking progress in the various development programs.

  Objective 3.2

  - None

  Objective 3.3

  - Vehicle Systems: ANL keeps headquarters informed of unusual events to avoid headquarters being caught off-guard.
  - Energy Storage: The ANL Energy Storage Program maintained a very high level of agreed milestones being either on track or completed on schedule. In addition, the program's management has consistently responded to DOE guidance and to requests for information or clarification regarding program direction, industry trends, and other related information.

NOTABLE DEFICIENCIES

- ***Biomass***

  Objective 3.1

  - None

  Objective 3.2

  - None

  Objective 3.3

  - None

- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***

  Objective 3.1

  - None

  Objective 3.2

  - None

  Objective 3.3

  - None

- ***Industrial Technologies Program***

  Objective 3.1

  - None

  Objective 3.2

  - None

Objective 3.3

- None

- ***Solar Energy Technologies Program***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

- ***Vehicle Technologies Program***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

SIGNIFICANT DEFICIENCIES

- ***Biomass***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

- ***Industrial Technologies Program***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

- ***Solar Energy Technologies Program***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

- ***Vehicle Technologies Program***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

SUPPORTING COMMENTS

- ***Biomass***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

- ***Industrial Technologies Program***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

- ***Solar Energy Technologies Program***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

- ***Vehicle Technologies Program***

Objective 3.1

- None

Objective 3.2

- None

Objective 3.3

- None

GUIDANCE FOR THE NEXT PERFORMANCE PERIOD

PERFORMANCE EXPECTATIONS FOR ARGONNE NATIONAL LABORATORY FOR THE NEXT PERFORMANCE PERIOD (for example, anticipated accomplishments and level of work, areas of concentration and remedial actions).

- ***Biomass***
  - Argonne should continue to provide the quality analysis support and maintain the leadership role it has established. Increased capabilities in conversion technologies would be ideal. Continued pursuit of the syngas fermentation capability would be a good addition to the program portfolio and distinguish Argonne with this capability. Continued improvement in communications is desirable, including being proactive in bringing new ideas and capabilities or partnerships to the headquarters program staff to assist in formulation of future directions for the biomass program.
- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***
  - Keep up the good work. Continue to focus on meeting milestones and deliverables in the Annual Operating Plans and provide prompt feedback to DOE Technology Development Managers, particularly with respect to critical analysis work.
- ***Industrial Technologies Program***
  - We anticipate that the Argonne team working with ITP will improve on their excellent performance in the next period, since they won't have to revise the focus

of their work to accommodate a change in program goals. The switch from the Office of Electricity to EERE required a major change in the drivers for the work they were doing. They responded to the change very well, but there was a learning curve.

- ***Solar Energy Technologies Program***
  - During the next performance period, Argonne is expected to conduct the analysis which identified which BLM-managed land is most appropriate for solar projects. This will require close cooperation with NREL, BLM, and DOE.
- ***Vehicle Technologies Program***
  - Vehicle Systems: ANL will increase its efforts to evaluate advanced plug-in hybrid electric vehicle drivetrains and components, will work with industry partners on developing an industry standard vehicle modeling and simulation tool based on the Powertrain systems Analysis Toolkit modeling tool developed by ANL, and will complete development and validation of new efficiency testing procedures for PHEVs. In the next performance period, ANL will concentrate on advancing fuel spray research and increase the power density of the light-duty engine under low temperature combustion conditions. Visioscope images will be obtained at high speeds and loads. In the hydrogen engine project, a multi cylinder, direct injected engine will be evaluated for efficiency and emissions.

INPUT ON CONCERNS FOR LABORATORY MANAGEMENT (discussion of potential problem areas):

- ***Biomass***
  - None
- ***Hydrogen, Fuel Cells and Infrastructure Technologies Program***
  - HFCIT recommends that ANL support the existing effective Principal Investigators' communications and interactions with HFCIT teams through stronger corporate coordination and communications between ANL and HQ. Examples include coordinated and timely submittal of quarterly and annual reports, and at least quarterly visits of a corporate ANL relationship manager to meet with HFCIT leads to discuss project progress, program priorities, and challenges. Bring Hydrogen Production projects to a logical conclusion in FY2009 with sufficient production data for H_2A analysis of the technologies' cost and performance potentials.
- ***Industrial Technologies Program***
  - None
- ***Solar Energy Technologies Program***
  - None

- ***Vehicle Technologies Program***
  - No potential problem areas could be identified.

Office of Science
U.S. DEPARTMENT OF ENERGY

Laboratory Year-End Performance Assessment Report

Date: 11/14/2008

Headquarters Program Office Fiscal Year 2008 Evaluation of UChicago Argonne, LLC for Management and Operation of the Argonne National Laboratory

Agency:
Department of Energy

Program Office:
Office of Nuclear Energy

FY Funding Level: (Budget Authority)
$12,900,000

Evaluator:
[redacted]

Phone Number:
[redacted]

E-mail Address:
[redacted]

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

Goal Score: 4.03 Goal Grade: A

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 1.0 Performance Summary Statement:

Develops advanced aqueous/solvent extraction flowsheets and electrochemical separations technologies for separation of key components in used nuclear reactor fuel for transmutation in thermal and fast reactors with the resulting waste in a form for safe disposal.

Leads and manages fast reactor, and advanced waste forms Research and Development campaigns

Objective 1.1 Science and Technology Results Provide Meaningful Impact on the Field

Score: 4.0 Grade: A Weighting: 30

Objective 1,1 Performance Summary Statement:

Both the advanced aqueous/solvent extraction flowsheets and the electrochemical separations technologies developed and demonstrated by ANL have provided the baseline for all current aqueous and electrochemical development projects in the U.S. and have significantly influenced those in other countries.

Research and Development conducted by ANL provides important information to support Advanced Fuel Cycle Initiative activities in the areas of fast reactors, particularly sodium fast reactors, and advanced waste forms.

Objective 1.2 Provide Quality Leadership in Science and Technology

Score: 3.9 Grade: A Weighting: 30

Objective 1.2 Performance Summary Statement:

Whenever senior technical expertise in separations technology, fast reactors technology, or waste forms is sought in the United States, the principal investigators at ANL are routinely identified as leaders in their areas.

Objective 1.3 Provide and Sustain Outputs that Advance Program Objectives and Goals

Score: 3.8 Grade: A Weighting: 20

Objective 1.3 Performance Summary Statement:

Advanced aqueous flowsheet information has been incorporated in the latest version of AMUSE (Argonne Model for Universal Solvent Extraction) code which allows both steady-state and dynamic profiles of chemical component concentrations to be predicted throughout a separations plant. The adaptation of the code to safeguard applications is being actively pursued. In electrochemical separations, pioneering work has been carried out on the conversion of used LWR and fast reactor oxide fuel to metallic form and its subsequent partitioning to various metallic products with the bulk of the fission products in molten salt. This development has potential future applications to very short-cooled fuel processing with substantial benefits in terms of reduced minor actinide content requiring multiple recycle.

Support program planning and other headquarters information needs in the areas of fast reactors and advanced waste forms.

Objective 1.4 Provide for Effective Delivery of Products

Score: 4.0 Grade: A Weighting: 20

Objective 1.4 Performance Summary Statement:

The products of NE's Advanced Fuel Cycle Initiative (AFCI) program are progress reports and open literature publications. The ANL AFCI staff has provided on a timely basis clear and articulate summaries of their R&D programs and been aggressive in publishing their results in the open literature (within the limitations imposed by export control, sensitive nuclear technology and Applied

Technology restrictions).

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operation of Research Facilities

Goal Score: 0.00 Goal Grade: NA

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 2.0 Performance Summary Statement:

Objective 2.1 Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)

Score: NA Grade: NA Weighting: 0

Objective 2.1 Performance Summary Statement:

Objective 2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components (execution phase, Post CD-2 to CD-4)

Score: NA Grade: NA Weighting: 0

Objective 2.2 Performance Summary Statement:

Objective 2.3 Provide Efficient and Effective Operation of Facilities

Score: NA Grade: NA Weighting: 0

Objective 2.3 Performance Summary Statement:

Objective 2.4 Utilization of Facilities to Grow and Support Lab's Research Base and External User Community

Score: NA Grade: NA Weighting: 0

Objective 2.4 Performance Summary Statement:

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Goal Score: 1.05 Goal Grade: C-

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 3.0 Performance Summary Statement:

Objective 3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision

Score: 0.0 Grade: NA Weighting: 20

Objective 3.1 Performance Summary Statement:

Objective 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management

Score: 3.5 Grade: A- Weighting: 30

Objective 3.2 Performance Summary Statement:

During a significant portion of FY-08, ANL provided "campaign" leadership for both separations and waste form R&D projects at ten national laboratories. That leadership was reasonably effective.

Objective 3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs

Score: 0.0 Grade: NA Weighting: 50

Objective 3.3 Performance Summary Statement:

Office of Science
U.S. DEPARTMENT OF ENERGY

Laboratory Year-End Performance Assessment Report

Date:
11/25/2008

Headquarters Program Office Fiscal Year 2008 Evaluation of UChicago Argonne, LLC for Management and Operation of the Argonne National Laboratory

Agency:
Department of Energy - National Nuclear Security Administration

Program Office:
Office of Defense Nuclear Nonproliferation

FY Funding Level: (Budget Authority)
$27.7M for FY2009 in AFP f...

Evaluator:
[redacted]

Phone Number:
[redacted]

E-mail Address:
[redacted]

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

Goal Score: 4.00 Goal Grade: A

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 1.0 Performance Summary Statement:

In 2008 Argonne National Laboratory has provided outstanding support in furthering the goals of the NNSA Global Threat Reduction Initiative, (GTRI) and thereby furthering U.S. goals in nonproliferation and prevention of nuclear terrorism.

Support from Argonne has been technically outstanding, timely, and relevant to both the technical and policy objectives of GTRI.

Global Threat Reduction Initiative– Reactor Conversion Program

The GTRI Reactor Conversion Program contributes to the U.S. government's nonproliferation policy by supporting the minimization, and to the extent possible, elimination, of the use of highly enriched uranium (HEU) in civil nuclear applications worldwide. The Program develops the technologies needed to substitute low enriched uranium (LEU) for HEU fuel in research and test reactors and also in the production of the medical isotope molybdenum-99 (^{99}Mo) without significant penalties in experiment performance, economic, or safety aspects of the reactors or ^{99}Mo production. Many of these research reactors are located in regions of proliferation concern.

The Program has set an aggressive goal to complete conversion of all targeted research reactors by 2018. The Program has identified 129 research and test reactors around the world, including in the United States, with which the program will cooperate convert. Of these 129 reactors, 62 have already fully or partially converted or closed down before conversion, 40 more can convert with available LEU fuels, and the final 27 cannot convert with available LEU fuels. To date, the United States has converted 16 domestic research reactors — the largest number in any single country. Two other additional domestic reactors are currently scheduled for conversion in FY2009.

Several noteworthy milestones have been recently completed this year: conversion to LEU fuel of the Russian-supplied research reactor in Uzbekistan, conversion of the Argentinean RA-6 research reactor; conversion of the SAFARI-1 research reactor in the Republic of South Africa; conversion of the U.S. domestic reactors at the Oregon State University (OSU), Washington State University (WSU); and the final shutdown and initiation of de-inventory of the ZPPR reactor at INL. Technical cooperation with the International Atomic Energy Agency (IAEA) with China, Nigeria, Ghana, Pakistan, and Syria regarding the conversion of the Chinese-designed MMSR reactors to LEU fuel has progressed and an agreement in principle to proceed with fuel demonstration in China in a collaborative manner has been reached and will be implemented in FY2009. A breakthrough with Russia has led to Rosatom accepting collaboration to initiate the feasibility studies for converting six of their domestic research reactors. Progress in the demonstration of LEU targets for the production of ^{99}Mo in Indonesia, with demonstrations available to a broader community through cooperation with the IAEA have been accomplished. A demonstration of LEU-based the Mo-99 domestic production is being carried out at the University of Missouri-Columbia and the program has initiated technical support for the domestic production of Mo-99 using a homogeneous solution reactor. Significant progress has been made in the continued development of monolithic UMo high density fuel, as well as in extruded dispersion UMo fuel development in Russia. The project for the establishment of a capability for the fabrication of UMo high density LEU fuel for the conversion of the 27 High Performance reactors has also been initiated in FY2008. A Request for Information (RFI) process has been conducted to gather commercial interest and capability to establish this capability. Significant progress has been made in initiating the process to convert the high performance research reactors in Belgium (BR-2) and France (RHF), as well significant technical process in qualification plans for fuel for the MARIA reactor in Poland and the WWR-K reactor in Kazakhstan. The bulk of the safety analysis for converting the reactors in Hungary (BRR) and Bulgaria (IRT-200) has been completed. Full core conversion analysis for Vietnam has been initiated. Finally, the RERTR-2008 (30th Anniversary) International Meeting was organized and successfully held in Washington in early October 2008.

Objective 1.1 Science and Technology Results Provide Meaningful Impact on the Field

Score: 4.0 Grade: A Weighting: 40

Objective 1,1 Performance Summary Statement:

Significant Achievements:

- In collaboration with the Institute of Nuclear Physics of Uzbekistan, Conversion to LEU of the fifth Russian-supplied reactor in Uzbekistan, WWR-SM.
- In cooperation with INL and in support of the Universities, conversion to LEU of the research reactors in the US at Oregon State University and Washington State.
- Completion of the preparations for the irradiation of an LEU Mo-99 production target at the MURR reactor. The foil target was fabricated at ANL.
- Successful organization of the RERTR International Meetings.
- Initiation of the Fuel Fabrication Capability project for UMo fuel to convert the 27 High Performance reactors.
- Rosatom agreed to the initiation of feasibility studies for conversion of 6 Russian domestic research reactors. Initiated scope of work discussions with Russian organizations to perform the studies.
- Initiated conversion analysis for BR-2 (Belgium) and RHF (France) research reactors.
- Neared completion of the feasibility studies (conditional to current UMo monolithic fuel parameters) for US High Performance reactors.

Notable Achievements:

- In support of the Argentinean Atomic Energy Commission, conversion to LEU of the research reactor in Bariloche, Argentina (RA-6).
- Initiation of the full core conversion studies for Vietnam's Dalat reactor.
- Continued progress and technical support in the fuel qualification for the MARIA (Poland) and Kazakhstan (WWR-K) research reactors.
- Two domestic organizations are in contact with Argonne for technical in studying ^{99}Mo production. Numerous studies regarding the recovery and purification of ^{99}Mo from irradiated targets have been done here. Argonne's expertise is viewed as a valuable resource to these potential producers.
- Significant progress in the development of UMo fuel, domestically and in Russia.

Objective 1.2 Provide Quality Leadership in Science and Technology

Score: 4.0 Grade: A Weighting: 20

Objective 1.2 Performance Summary Statement:

Argonne's leadership is widely recognized by the international research reactor community and the International Atomic Energy Agency. This is shown by the following accomplishments:

Significant Achievements:

- Provided overall technical leadership for the GTRI-Convert program. Directly supported the Program Office with HQ support, particularly in the second half of the fiscal year.
- Led the establishment of a group for the study and fuel qualification for the conversion of two European high performance reactors.
- Led US High Performance reactor group toward interaction with fuel development group and completion of the feasibility studies.
- Provided technical expertise and leadership in the Coordinated Research Project (CRP) at the IAEA for the LEU-based production of ^{99}Mo. Led technology demonstration workshops.
- Argonne provided leadership in the coordinated research project (CRP) at the IAEA for studying the conversion of Miniature Neutron Source Reactors (MNSR) of Chinese design. ANL provided leadership in seeking technical scope for the demonstration of LEU fuel for MNSR reactors.
- Trained analysts from Vietnam and Uzbekistan in analysis methods for the conversion of research reactors to LEU fuel.

Notable Achievements:

- Leadership in IAEA research reactor fuel qualification guidelines project.
- Participation IAEA procurement project for LTA fuel for MARIA reactor in Poland.
- Provided leadership for the technical scope of the fuel qualification for WWR-K in Kazakhstan.
- Provided leadership for the scope for the Russian UMo fuel development and the PIE analysis for the domestic UMo fuel development.

Objective 1.3 Provide and Sustain Outputs that Advance Program Objectives and Goals

Score: 4.0 Grade: A Weighting: 20

Objective 1.3 Performance Summary Statement:

Significant Achievements:

Organized the 30th Annual International Meeting on the Reduced Enrichment for Research and Test Reactors held in October in Washington DC, with about 250 participants and about 90 scientific papers.

- Organized Global Initiative Workshop in Sydney, Australia on the production of Mo-99 with LEU technologies.
- Provided technical data and expertise in support of a National Academy of Science Study on the production of ^{99}Mo medical isotope.

Notable Achievements:

- Numerous scientific papers and presentations to RERTR International meetings, technical journals, IAEA, and sponsors.

Objective 1.4 Provide for Effective Delivery of Products

Score: 4.0 Grade: A Weighting: 20

Objective 1.4 Performance Summary Statement:

Significant Achievements:

- Supported the safety analysis and regulatory review for meeting the Washington State University and Oregon State University reactor conversion milestones.
- Support for the safety analysis and regulatory review for meeting the University of Wisconsin University reactor conversion milestone (ongoing).
- Support and training of Uzbekistan's INP scientists in mixed HEU-LEU core burnup calculations.
- Support and training of Vietnam scientists in mixed full core conversion calculations.

Notable Achievements:

- Met enhanced sponsor goals on program reporting, both technical as well as administrative.

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operation of Research Facilities

Goal Score: 0.00 Goal Grade: NA

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 2.0 Performance Summary Statement:

Objective 2.1 Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)

Score: NA Grade: NA Weighting: 0

Objective 2.1 Performance Summary Statement:

Objective 2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components (execution phase, Post CD-2 to CD-4)

Score: NA Grade: NA Weighting: 0

Objective 2.2 Performance Summary Statement:

Objective 2.3 Provide Efficient and Effective Operation of Facilities

Score: NA Grade: NA Weighting: 0

Objective 2.3 Performance Summary Statement:

Objective 2.4 Utilization of Facilities to Grow and Support Lab's Research Base and External User Community

Score: NA Grade: NA Weighting: 0

Objective 2.4 Performance Summary Statement:

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Goal Score: 4.00 Goal Grade: A

Please complete the Objective fields then click the Calculate button to get the final Score and Grade.

Goal 3.0 Performance Summary Statement:

Argonne has provided effective and efficient program management as demonstrated by its ability to support an increasing rate of domestic and international reactor conversions and by its timely and appropriate response to GTRI program requirements and headquarters tasking. This includes expert analysis, technical consultations, and deployment of staff and resources to successfully address changing program priorities

Significant Achievements:

- Provided overall technical leadership for the GTRI-Convert program. Supported directly the Program Office with HQ support, particularly in the second half of the fiscal year.

- Maintained competency in fuel development and performance (analysis and modeling) by enhancing cooperation with Russia.

Notable Achievements:

- Supported development of the program vision by providing the technical expertise for expansion plans.

Objective 3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision

Score: 4.0 Grade: A Weighting: 20

Objective 3.1 Performance Summary Statement:

Because of the involvement of Argonne National Laboratory with the reactor conversion program dates back to the late 1970s, it is the repository of technical, policy, and management issues pertaining to research reactors use of LEU and the conversion program. It's long term commitment to this program and it's technical expertise provides the basis for its stewardship and its vision regarding next steps towards the ultimate goal of eliminating and minimizing the use of HEU in research and test reactors.

Significant Achievements:

- Provided overall technical leadership for the GTRI-Convert program. Supported directly the Program Office with HQ support, particularly in the second half o the fiscal year.

- Maintained competency in fuel development and performance (analysis and modeling) by enhancing cooperation with Russia.

Notable Achievements:

- Supported development of the program vision by providing the technical expertise for expansion plans.

Objective 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management

Score: 4.0 Grade: A Weighting: 30

Objective 3.2 Performance Summary Statement:

Planning and project management requires clear understanding of the ultimate goal, the technical and procedural steps necessary to achieve the goal, and a commitment to overcome barriers, whether technical, regulatory, or political. Argonne uniquely meets these requirements, which are necessary for effective and efficient project and program planning. This has been demonstrated in it's management of an increasing number of sites and conversions.

Significant Achievements:

- Fully implemented sponsor's enhanced project/program management system.
- Fully contributed to lifecycle and budget development for the program.
- Coordinated all periodic reporting within the program as well as ad hoc reporting to support specific meetings.
- Supported establishment or enhancement of international collaborations in conversion program: IAEA, Russia, China, Japan, European High Performance reactors.

Notable Achievements:

- Developed and maintained project management documentation, including project work plans, Gantt charts, schedules, work packages, and work package budget tracking.

Objective 3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs

Score: 4.0 Grade: A Weighting: 50

Objective 3.3 Performance Summary Statement:

Communication with Argonne on program goals is constant, and effective, taking the form of phone calls, email, and frequent face-to-face discussions. Argonne has shown agility and foresight in responding to the concerns of GTRI headquarters as well as to many sites which are conducting or planning conversions. Because of their long experience working with sites, Argonne can emphasize with the concerns of operators, anticipate them, and better respond to them. This is demonstrated in the excellent personal working relationships that Argonne staff maintain with both GTRI headquarters and with staff at individual sites.

Significant Achievements:

- Accurately responded to frequent sponsor requests for technical information and support.
- Implemented an enhanced technical and programmatic reporting system, making sponsor aware of positive as well as negative developments.

Notable Achievements:

- Routine technical and scientific information is provided to sponsor for program direction and tracking — daily updates are normally provided on technical events.